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ABSTRACT

This booklet is a compilation of sources of cartographic information, ideas and materials. Designed for geography and social studies teachers, the guide tells where to obtain: 1) additional information and ideas on the preparation and use of cartographic materials; 2) motion pictures, filmstrips and slides on mapping and photography; 3) statistical data useful for thematic map preparation; 4) matching aerial photographs and topographic maps of outstanding physical and cultural features in the U.S.; 5) sheet maps and other cartographic materials from government and society sources; 6) wall maps, outline maps, map transparencies, globes, relief models, atlases, and related materials from commercial sources; 7) aerial and space photographs; and 8) interpretation and drawing equipment. Annotations and complete bibliographic information are included in the citations which were chosen on the basis of potential value to high school geography or other social studies courses, probable availability to the teacher, and recency of publication. (Author/SHM)

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SOURCES OF INFORMATION AND MATERIALS:

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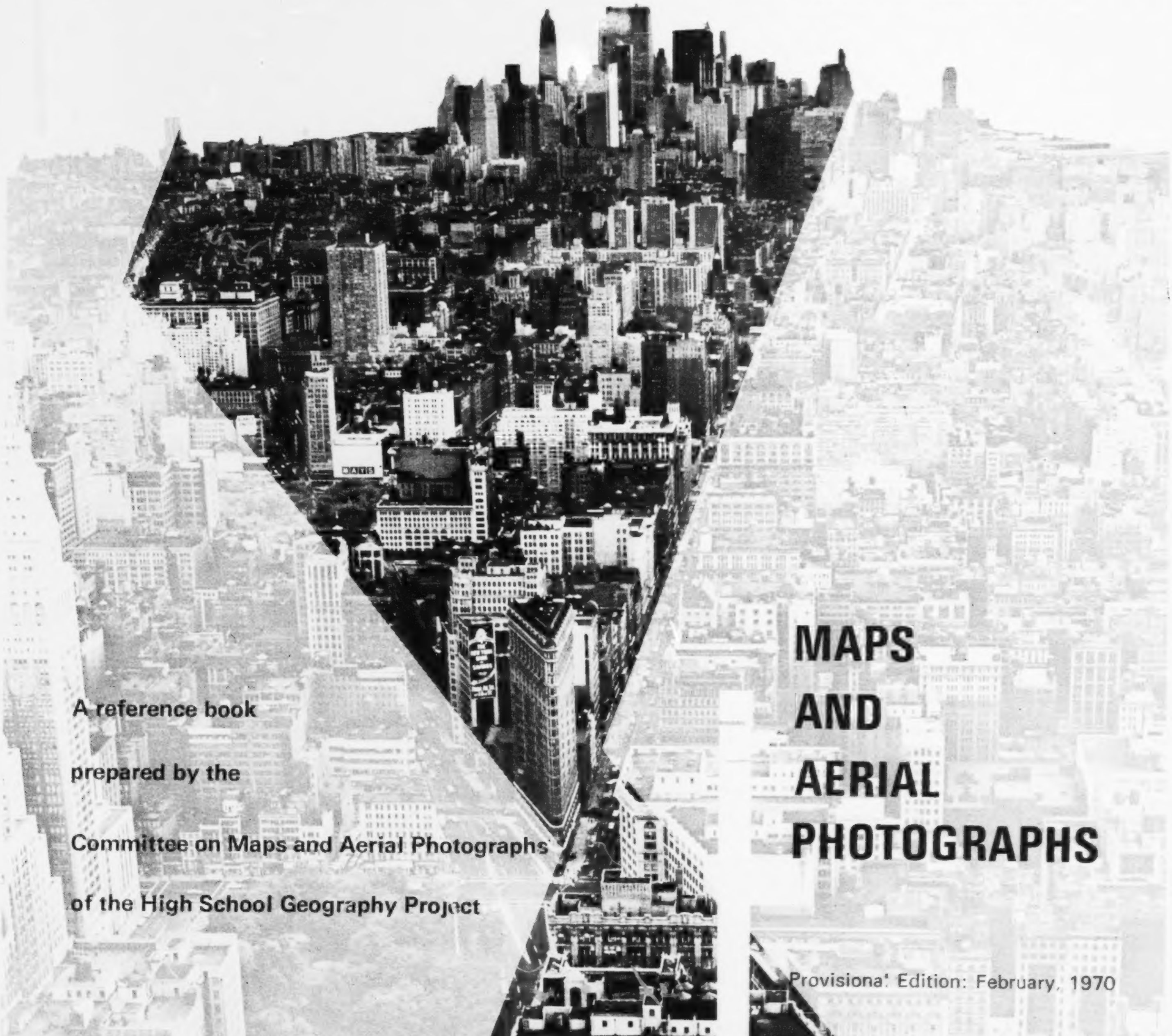

A reference book

prepared by the

Committee on Maps and Aerial Photographs

of the High School Geography Project

Provisional Edition: February, 1970

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SOURCES OF INFORMATION AND MATERIALS: MAPS AND AERIAL PHOTOGRAPHS

A reference book prepared by the
Committee on Maps and Aerial Photographs
High School Geography Project

Supported by the National Science Foundation

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PREFACE

While this booklet should prove valuable to geography and social studies teachers using units of the High School Geography Project's course, *Geography in an Urban Age*, it was compiled with a wider audience in mind. Hopefully, the reference will be useful to teachers who need sources of cartographic information, ideas and materials.

This booklet represents a portion of a reference work on maps and air photos prepared by members of the Committee on Maps and Aerial Photographs of the High School Geography Project of the Association of American Geographers. The reference work is the collective efforts of geographers, cartographers, high school teachers and many others. Members of the Committee on Maps and Aerial Photographs are:

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The editors of the High School Geography Project and the members of the Committee on Maps and Aerial Photographs have endeavored to make Sources of Information and Materials: Maps and Aerial Photographs as complete and accurate as possible. However, errors and omissions may exist in this provisional edition which was completed in September, 1968. Comments, corrections and additions, addressed to HSGP, P.O. Box 1095, Boulder, Colorado 80302, are welcome.

INTRODUCTION

"Source" is the purpose of this booklet. It is designed to tell teachers where to obtain:

. . . additional information and ideas on the preparation and use of cartographic and photographic materials.

. . . motion pictures, filmstrips and slides on mapping, and photography.

. . . statistical data useful for thematic map preparation.

. . . matching aerial photographs and topographic maps of outstanding physical and cultural features in the United States.

. . . sheet maps and other cartographic materials from government and society sources.

. . . wall maps, outlines maps, map transparencies, globes, relief models, atlases, and related materials from commercial sources.

. . . aerial and space photographs.

. . . interpretation and drawing equipment.

SOURCES OF INFORMATION AND MATERIALS:
MAPS AND AERIAL PHOTOGRAPHS

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1. INFORMATION AND IDEAS: AN ANNOTATED BIBLIOGRAPHY

The literature of cartography, aerial photography, and other remote sensing has been relatively prolific in recent years. Many books, journal articles, pamphlets, and documents on these subjects have been published. Some of these references have potential value in high school geography work.

The material listed in this bibliography has been chosen on the basis of potential value to high school geography or other social studies courses, probable availability to the teacher, and recency of publication. The highly selective list includes over 150 entries. Material applicable only to use in the lower grades has been omitted as has the technical literature of professional cartography and aerial photography. Books, pamphlets, and government documents of American origin are included; foreign publications are generally excluded because they are not widely available to teachers. Pertinent articles that have appeared the last 15 years in professional education journals and popular magazines are included. Professional education journals represented in the bibliography include _Social Education_, _Social Studies_, _The Instructor_, _Audiovisual Instruction_, _Catholic School Journal_, and _The Journal of Geography_. The last, the journal of the National Council for Geographic Education, is a particularly fruitful source of articles on classroom map use and interpretation. Popular magazines represented include _National Geographic Magazine_, _Holiday_, _Life_, _Harpers_, and _Scientific American_.

Articles by professional geographers, cartographers, photogrammetists, and others, reporting the results of technical research and aimed at a professional audience, appear in such journals as Annals of the Association of American Geographers, Photogrammetric Engineering (journal of the American Society of Photogrammetry), Surveying and Mapping (journal of the American Congress on Surveying and Mapping), The Geographical Review (journal of the American Geographical Society), and others. Generally, such articles are of little potential value to high school work and the journals often are unavailable to high school teachers. For these reasons, the bibliography excludes such articles with the exception of those of potential value to high school teachers which have been issued in the Bobbs-Merrill Reprint Series.

Journal articles and other publications listed in this bibliography as being published in the Bobbs-Merrill Reprint Series are available at $.25 to $1.00 each. Write for a complete list and prices to:

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Publications of the National Council for Geographic Education listed in this bibliography include Topics in Geography, Do It This Way Series, Geographic Education Series, and others. For a complete listing of their publications and prices, write:

National Council for Geography Education
Room 1532
111 West Washington Street
Chicago, Illinois 60602

These divisions are used in this bibliography: Maps and Mapping; Aerial Photography and Other Remote Sensing; Teaching Techniques and Classroom Lessons. Where appropriate, some publications are cross-referenced between divisions.

Maps and Mapping

Blumenstock, David I., "The Reliability Factor in the Drawing of Isarithms," Annals of the Association of American Geographers, Vol. XLIII, No. 4 (Dec., 1953), pp. 289-304; also, Bobbs-Merrill Reprint Series in Geography, G-15.

The paper focuses on the relationship between the reliability of plotted data and the degree of precision that can reasonably be exercised in drawing isarithms to fit the data. A statistical method is presented for estimating accuracy of fit of isarithms.

Boggs, S. Whittemore, "Mapping the Changing World: Suggested Developments in Maps," Annals, Association of American Geographers, Vol. XXXI, No. 2 (March, 1941), pp. 119-128; also, Bobbs-Merrill Reprint Series in Geography, G-16.

This paper suggests that the complex relationships in a world of dynamic change calls for continuing innovation in mapping. Although written nearly 30 years ago, this thesis remains timely, and the remarks, along with examples, could be applied in today's teaching.

Borchert, John R., "The Dimensions of Geography in the School Curriculum," The Journal of Geography, Vol. LXIV, No. 6 (Sept., 1965), pp. 245-259.

The author emphasizes that one of the major dimensions in geographical instruction is an appreciation of maps and the basic role they play in understanding geographical relationships, processes, and as a mode of exchanging information with other disciplines.

Brown, Lloyd A., Map Making: The Art That Became A Science, Boston: Little, Brown, 1960.

This book is a history of the need for maps, the development of measurements necessary for their construction, and of some individual mapping efforts. The artistic tradition in cartography is discussed in detail and an effort is made to demonstrate that it became more scientific through the years.

Brown, Lloyd A., *The Story of Maps*, Boston: Little, Brown, 1949.

This is a non-technical history of maps, cartographers, and cartographic methods. The material is presented for the non-professional and may appear to be less concise than acceptable to a critical reviewer. An extensive bibliography in many languages is appended.

Burkard, R. K., *Geodesy for the Layman*, St. Louis, Missouri: U.S. Aeronautical Chart and Information Center, 1964; also, Bobbs-Merrill Reprint Series in Geography, G-242.

This booklet introduces the study of geodesy to the beginner as well as to develop an appreciation of its contributions. Mathematics is simplified in an illustrated presentation of the history of the subject, its tasks, and techniques.

Chamberlain, Wellman, Charles E. Riddiford, and Gilbert Grosvenor, *The Round Earth on Flat Papers: Map Projections Used by Cartographers*, Washington, D.C.: National Geographic Society, 1950.

Along with a review of the National Geographic Society's map services is an extensive treatment of map projections. The material is well illustrated and non-technical. The problem of presenting the earth on flat surfaces is surveyed, appropriately for the beginner.

Crone, G. R., *Maps and Their Makers*, revised edition, New York: Hutchinson's University Library, 1962.

This is an introduction to the history of cartography from classical times to the mid-twentieth century. Most of the historically important cartographers are discussed. Unfortunately, the work contains very few illustrations.

Cross, Gilbert, "The Marvel of Maps," *Holiday*, Vol. 38, No. 1 (July, 1965), pp. 106 ff.

This essay details the benefits of using topographic maps published by the United States Geological Survey. For recreation and other uses these maps have an unlimited appeal due to their accuracy and low cost.

Dahlberg, Richard E., "Maps Without Projections," *The Journal of Geography*, Vol. LX, No. 5 (May, 1961), pp. 213-218.

The author voices concern and caution about the tendency to publish maps which either omit the projection grid entirely or preserve a misleading remnant of it. On some maps interruptions and omissions are not always apparent These procedures conceal the basic structure of projections and can, therefore, misrepresent spatial relationships.

Deetz, Charles H. and Oscar S. Adams, Elements of Map Projections, Special Publ. No. 68, U.S. Coast and Geodetic Survey, Washington, D.C.: U.S. Government Printing Office, 1944.

A detailed, well illustrated presentation of map projections. Technical information and, where necessary, tables for the construction of projections are provided.

Delaney, Arthur A., "Making a Contour Map Model," The Journal of Geography, Vol. LXI, No. 7 (Oct., 1962), pp. 310-312.

The ability to visualize topographic land features may be accelerated by using a simple but effective contour model. A method for construction is outlined here.

Dille, John, "The Missile-era Race to Chart the Earth," Life, Vol, XLIV, No. 19 (May 12, 1958), pp. 124 ff.

This article traces the efforts of American geodesists in determining the exact size and shape of the earth. A surprising amount of the earth's surface has never been surveyed. The description of methods and problems illustrates the necessity and potentials of accurate mapping and measurement.

Drumheller, Sidney J., "Conjure Up a Map--A Crucial But Neglected Skill," The Journal of Geography, Vol. LXVII, No. 3 (March, 1968), pp. 140-146.

Since a map never accompanies a radio broadcast and rarely a newspaper or television report, information which requires comprehension within a spatial framework often calls for mental map construction. The author directs attention to developing this skill in the beginning school years, though the concept is applicable to persons of any age.

Espenshade, Edward B. Jr., "Cartographic Developments and New Maps," New Viewpoints in Geography, Edited by Preston E. James, Washington, D.C.: Twenty-ninth Yearbook, National Council for the Social Studies, 1959, pp. 93-111.

A differentiation between the science of cartography and geographic cartography is drawn and interest focused on the latter. Map function, the map as a base for recording data, the map as an analytic device, map design, and map projections are presented as they have developed through the 1950's.

Fisher, Irving and O. M. Miller, *World Maps and Globes*, New York: Essential Books, 1944.

Written in non-technical language, the book attempts to familarize the layman or beginner with the most used projections, the advantages and shortcomings of these projections, and to dispell many learned misconceptions. The material is directed to a wide audience, but should be appropriate for the serious high school student.

Garnier, B. J., *Practical Work in Geography*, New York: St. Martin's Press, 1963.

This volume covers the collection of data and from it the preparation of maps and diagrams, and the interpretation of existing maps and aerial photographs. A number of suggested laboratory exercises that could easily be used on the high school level are included. Diagrams and maps used as illustrations have been kept deliberately simple.

Getis, Arthur, "The Determination of the Location of Retail Activities with the Use of a Map Transformation," *Economic Geography*, Vol. XXXIX, No. 1 (Jan., 1963), pp. 14-22; also, Bobbs-Merrill Reprint Series in Geography, G-69.

This tests the use of a map distortion for examining theoretical trade area organization. Disposable income in Tacoma, Washington, is areally distorted in a controlled manner to obtain trade areas.

Greenhood, David, *Down to Earth*, New York: Holiday House, 1951.

A good book for beginners, it was designed to give an understanding and appreciation of maps. Most of the important, introductory considerations in cartography are presented in a readable fashion.

Greenhood, David, *Mapping*, Chicago: University of Chicago Press, 1964.

This is a later, better illustrated version of the author's approach developed in *Down to Earth*. The non-technical discussion of a wide range of topics is appropriate for the beginner or amateur map fancier.

Harrison, Richard Edes, "Why Our Maps Aren't Good Enough," Harpers, Vol. CCXVII, No. 1298 (July, 1958), pp. 83-84.

This is part of a speech by a leading American cartographer on shortcomings in American maps. He singles out three reasons why American maps do not attain the quality of many foreign maps: gaps in personnel training, an unwillingness to accept art as a full partner in designing and drafting along with technology, and a too rigid application of technological devices and requirements.

Hazel, Joseph A., "Most Good Maps Do Not Have a Directional Symbol," The Journal of Geography, Vol. LXIV, No. 2 (Feb., 1965), pp. 81-83.

The article points out clearly that directional symbols can be very misleading on non-rectangular projections. Either a projection grid or numbers indicating degrees of latitude and longitude are most desirable on the non-rectangular grids currently prevalent in map presentations.

Hess, Maynard, "Recipe for a Paper-Mache Relief Map," The Journal of Geography, Vol. LVIII, No. 9 (Dec., 1959), pp. 457.

A list of materials and a step-by-step procedure is outlined for the construction of a terrain model.

Hoffmeister, H. A., Construction of Map Projections (Bloomington, Illinois: McKnight and McKnight, 1946).

This booklet presents a brief introduction to map projections and proceeds to outline the graphic construction, step-by-step, of 17 most commonly used projections. The directions are clear and each projection is illustrated. The material is well within the range of high school students.

Ives, Ronald L., "Longitude Degree Length at Various Latitudes," The Journal of Geography, Vol. LXIII, No. 5 (May, 1964), pp. 205-210.

A geometrical method of obtaining longitude distances at any latitude is presented in a manner simple to understand. The "Bourne Computer" is described and examples given of its simplicity.

Jenks, George F., "Generalization in Statistical Mapping," *Annals of the Association of American Geographers*, Vol. LIII, No. 1 (March, 1963), pp. 15-26; also, Bobbs-Merrill Reprint Series in Geography, G-107.

Problems encountered in presentation of statistical surfaces are discussed and well illustrated by this noted geographic cartographer. Constant class intervals are contrasted with a number of mathematically derived intervals and the resulting visual presentation compared. Clear, three-dimensional illustrations highlight the paper.

Jenks, George F. and Duane S. Knos, "The Use of Shading Patterns in Graded Series," *Annals of the Association of American Geographers*, Vol. LI, No. 3 (Sept., 1961), pp. 316-334; also Bobbs-Merrill Reprint Series in Geography, G-108.

This reports on controlled experiments in the use of graded series on shaded pattern maps. Included are the results of tests on map user preferences in screen patterns and scales for graded series. Text is very readable and illustrations are excellent.

Kimble, George H. T., "The Gaps in Our Maps," *The Reporter*, Vol. XXVI, No. 10 (May, 1962), pp. 38-40.

This noted geographer points out that even today, with all the technological innovations and the long history of world mapping, a great deal of the world has yet to be mapped scientifically. This applies particularly to large scale mapping and mapping the ocean floors.

Kingsbury, Robert C., "The World of Little Maps," *The Journal of Geography*, Vol. LXIII, No. 8 (Nov., 1964), pp. 355-366.

Here, a cartographer explores the presentation of maps on postage stamps. Many nations engage in this practice and the results are often quite pleasing. Delightful composition, excellent use of color, and finely balanced detail are all reminders of the link between cartography as art and as science. A number of map stamps are reproduced, and they demonstrate that the "message" of these small maps is as varied as their larger counterparts.

Kohn, Clyde F., "Maps of the Earth's Surface," *Social Education*, Vol. XX, No. 4 (April, 1956), pp. 153-155.

The writer identifies map features that often confuse the inexperienced map user. He argues that altitude, slope, and ruggedness must be shown clearly for the map reader to grasp surface conditions at any location. The merged-relief tint and shading techniques may be a practical answer to this problem.

Kuester, Sharon, "Starch and Detergent Relief Models," The Journal of Geography, Vol. LVIII, No. 1 (Jan., 1959), pp.

Details are given on how to use starch and detergent as molding material for construction of a relief model. When thoroughly dried, a model of this type may be painted, coated with shellac, and is reasonably durable.

Leppard, Henry M. and L. Philip Denoyer, Map Projection Studies, Chicago: Denoyer-Geppert, 1943.

This booklet is designed to demonstrate the striking differences among grids drawn from a number of the more often used projections. Those selected present the fundamental concepts involved in a knowledge of projections basic to both map making and map reading. A number of questions accompany each projection.

Lobeck, Armin K., Block Diagrams and Other Graphic Methods Used in Geology and Geography, Amherst, Massachusetts: Emerson-Trussell, 1958.

A liberally illustrated volume which outlines at length the construction of landscape diagrams. Landform block diagrams, isometric diagrams, special methods for more elaborate diagrams, landscape sketching, and crystal drawing are discussed in detail.

Lobeck, Armin K., Things Maps Don't Tell Us; An Adventure into Map Interpretation, New York: MacMillan, 1956.

The author attempts to develop an appreciation of map interpretation through a lengthy list of brief examples. Physigraphic features are emphasized as a case for hypothesizing explanations of origin and process from mapped phenomena.

MacKay, J. Ross, "Percentage Dot Maps," Economic Geography, Vol. XXIX, No. 3 (July, 1953), pp. 263-266; also, Bobbs-Merrill Reprint Series in Geography, G-145.

Advantages of the percentage dot map over the more often used, quantitative dot map are weighed by the author. Expansion of information and enhanced visual comparison are judged to favor the percentage dot map for many presentations.

MacKay, J. Ross, "Some Problems and Techniques in Isopleth Mapping," *Economic Geography*, Vol. XXVII, No. 1 (Jan., 1951), pp. 1-9; also, Bobbs-Merrill Reprint Series in Geography, G-145.

This discussion analyzes some of the major considerations encountered in isopleth mapping. Data reliability, location of control points, placement of lines, and intervals for isopleths are explored.

Monkhouse, F. J. and H. R. Wilkinson, *Maps and Diagrams; Their Compilation and Construction*, New York: E. P. Dutton, 1952.

The emphasis of this book by two noted British geographers is on how to make maps and diagrams. With only limited attention to materials and techniques, the writers discuss in detail the different means of presenting topical phenomena. Although the content is directed to college students who have had some exposure to the fundamentals of cartography, parts are appropriate for high school use.

Raisz, J. Erwin, *General Cartography*, New York: McGraw-Hill, 1948.

This is a valuable reference work on map types and mapping techniques. Often used as a college text, the book is especially strong in relief portrayal, history of maps, and map projections. Most elements in cartography receive some attention.

Raisz, J. Erwin, *Principles of Cartography*, New York: McGraw-Hill, 1962.

This is an accepted text and reference work which is much less extensive than the author's *General Cartography*. Designed for the college student beginning in cartography, the book treats briefly most essentials in the field, and is especially strong in relief presentation. Much of the material could be readily understood by high school students.

Ristow, Walter W., "Journalistic Cartography," *Surveying and Mapping*, Vol. XVII, No. 4 (Oct.-Dec., 1957), pp. 369-390; also, Bobbs-Merrill Reprint Series in Geography, G-194.

The author expands on one area where cartography has maintained the character of inventiveness, craftsmanship, and self-expression in spite of forces that have pushed the field toward standarization and mass-produced products. Many worthwhile illustrations are included.

Ristow, Walter W., *Three Dimensional Maps; An Annotated List of References Relating to the Construction and Use of Terrain Models*, Washington, D.C.: U.S. Library of Congress, Map Division, 1964.

This is an annotated listing of 395 books and papers in several languages. Materials on the history, use, and construction of models are included.

Ristow, Walter W. and C. E. LeGear, *A Guide to Historical Cartography: A Selected, Annotated List of References on the History of Maps and Map Making*, Washington, D.C.: U.S. Library of Congress, Map Division, 1960.

This is a highly selective bibliography of works that are judged to be particularly distinctive. Material in several languages appears with English annotations.

Robinson, Arthur H., "Cartography--Which Way?," *The Journal of Geography*, Vol. LXVI, No. 1 (Jan., 1967), pp. 4-5.

The author considers the future place of cartography within academic fields. Growth and development of cartography, different training required, and inattention to its potential by geographers could result in a split into different academic departments.

Robinson, Arthur H., *Elements of Cartography*, 2nd edition, New York: John Wiley, 1960.

This college text and reference book covers most of the major themes in cartography. Techniques of drafting, compilation, design, and reproduction of maps and related presentations are developed in a clear, well illustrated fashion. Much of the material could be used on the high school level.

Rodyenko, Peter, "A Three-dimensional Model Illustrates Reading Relief by Contour Lines," *The Journal of Geography*, Vol. LVII, No. 2 (Feb., 1958), pp. 78-82.

Here is a blueprint for the construction of a balsa wood relief model to illustrate contouring in the classroom. The final product is lightweight, portable, and has demonstrated good results for the author.

Schmid, Calvin F., *Handbook of Graphic Presentation*, New York: Ronald Press, 1954.

This manual is designed to assist those endeavoring to present and interpret statistical data in graphic form. Emphasis is on the use and preparation of graphs and charts.

Schmid, Calvin F. and Earle H. MacCannell, "Basic Problems, Techniques, and Theory of Isopleth Mapping," *Journal of the American Statistical Association*, Vol. L, No. 269 (March, 1955), pp. 220-239; also, Bobbs-Merrill Reprint Series in Geography, G-203.

This article raises and discusses critical problems in isopleth mapping. These include the influence of the size of base areas, the location of control points, isopleth intervals, interpolation, and the relationship of statistical theory and isopleth mapping.

Sherman, John C., "Maps the Blind Can See," *The Journal of Geography*, Vol. LIV, No. 6 (Sept., 1955), pp. 289-295.

This article reports on a pioneering effort to provide maps for the blind. Research indicates that the concept is practical, and it introduces design considerations that can carry over to normal mapping procedure. Standardization of symbols by shape and texture and the use of variety of materials on a plywood base produces a map useful to both blind and sighted persons.

Tobler, Waldo R., "Geographic Area and Map Projections," *The Geographical Review*, Vol. LIII, No. 1 (Jan., 1963), pp. 59-78; also, Bobbs-Merrill Reprint Series in Geography, G-231.

Maps confined to traditional projections often fail to illuminate many spatial concepts. Deliberate, controlled distortion of geographic area in the form of cartograms can yield insight in many problems as demonstrated in this article.

Tooley, Ronald V., *Maps and Map Makers*, New York: Bonanza Books, 1961.

This is a short history of cartography and cartographers with focus on European cartographers. It contains a number of fine reproductions of early maps. An extensive collection of notes and references is appended.

Thompson, Morris M. and Julius L. Speert, "Mapping the Surface of the Earth," *Natural History Magazine*, Vol. LXIII, No. 8 (Oct., 1964), pp. 30-37.

The authors describe the wide utility of topographic maps, how they are classified, and how they are made. Easy to interpret illustrations accompany a text written for the interested layman.

United States Army Corps of Engineers, Map Intelligence, Washington, D.C.: U.S. Army Map Service, 1954.

Here is a general manual written to familarize students with maps, to build their analytical skills, and to provide experience in applying learned skills. The material is encyclopedic in scope, treating mapping techniques, map uses, map projections and special grids, surveying, and aerial photography. The book could serve as a reference for classroom exercises.

United States Army Map Service, Plastic Relief Maps, Army Map Service Bulletin No. 29, Washington, D.C.: U.S. Government Printing Office, 1956.

This booklet describes the construction and care of plastic relief maps. Materials and methods are outlined.

United States Department of the Army, Foreign Maps, Technical Manual No. 5-248, Washington, D.C.: Department of the Army, 1963.

This is a basic manual prepared for users of foreign maps. The method by which foreign maps are evaluated and adapted for use is followed by a survey of foreign maps and mapping agencies.

United States Department of the Army, Map Reading, Field Manual No. 21-26, Washington, D.C.: Department of the Army, 1960.

This work is a standard treatment of map-reading principles in the form of an army training manual. It is an illustrated, clear discussion with emphasis on terrain comprehension, and is well within the abilities of the high school student.

United States Department of the Army, Terrain Models and Relief Map Making, Technical Manual No. 5-249, Washington, D.C.: Department of the Army, 1956.

This is an illustrated manual on how to prepare relief models. Both plaster and plastic materials are discussed along with directions for the use of tools and materials.

United States Defense Intelligence Agency, Glossary of Mapping, Charting, and Geodetic Terms, Washington, D.C.: Department of Defense, 1967.

This glossary was prepared to provide users and producers of cartographic products with definitions of technical terms used in mapping, charting, and geodesy.

United States Tennessee Valley Authority, Maps and Surveys, Knoxville, Tennessee: Tennessee Valley Authority, 1966.

This booklet outlines the assignment and methods of the Maps and Surveys Branch of the Authority. Survey and map problems and techniques are illustrated briefly.

United States Tennessee Valley Authority, Surveying, Mapping, and Related Engineering, Technical Report No. 23, Washington, D.C.: U.S. Government Printing Office, 1951.

This is one of a series of technical reports on the experience of the T.V.A. in carrying out the major phases of its program. The work is well illustrated and quite readable in its description of surveying and mapping, though often detailed on subsidiary engineering problems. Those portions of the book devoted to topographic map construction are within the range of advanced high school students.

Warman, Henry J., "How to Make a Relief Model Quickly," The Journal of Geography, Vol. LVI, No. 6 (Sept., 1957), pp. 253-257.

A simple, quick, and instructive method for constructing a relief model is given. Students participate actively in the project which involves the drawing of cross sections. Sections are drawn on graph paper with a common base level, placed on cardboard, and assembled on a frame.

Withington, William A., "The Density of Population in Southeast Asia: Problems in Mapping Spatial Variation," The Journal of Geography, Vol. LXIV, No. 1 (Jan., 1965), pp. 14-23.

Problems encountered in mapping population density in Southeast Asia are universally applicable. Data limitations, poor delimitation of sub-national units, and variation of size in areal units are discussed in this example.

Wright, John K., "Map Makers are Human; Comments on the Subjective in Maps," The Geographical Review, Vol. XXXII, No. 4 (Oct., 1942), pp. 527-544; also, Bobbs-Merrill Reprint Series in Geography, G-258.

The subjective element in map production is explored at length. The fact that no map can be exactly objective due to generalizations inherent in all maps requires intellectual honesty by the cartographer, and an ever critical evaluation by the map user.

Aerial Photography and Other Remote Sensing

Allum, J. A. E., Photogeology and Regional Mapping, New York: Pergamon Press, 1966.

This is a technical treatment of aerial photography as applied to geological mapping. Twenty stereopairs accompany a description on how to use them. The material is oriented to persons with training in geology.

American Society of Photogrammetry, Manual of Color Aerial Photography, Falls Church, Va.: American Society of Photogrammetry, 1968.

This handsome volume represents the results of pioneering work by a group of researchers on the development, techniques, application, and interpretation of color aerial photographs. It is the reference book on this topic. While much of the material is technical and not directed to the high school level, many parts of the manual can be most useful in high school work. This especially applies to the vast number of fine illustrations. In addition to many black-and-white illustrations, there are 105 pages of colored photographs and diagrams. Included among these are 54 pages of excellently reproduced normal color, infrared color, and multiband color aerial and space photographs of a wide variety of physical and cultural features.

American Society of Photogrammetry, Manual of Photogrammetry, revised edition, two volumes, Washington, D.C.: American Society of Photogrammetry, 1960.

This is an updated version of a general manual originally issued in 1952. The coverage is extensive and includes many fields of inquiry. Along with discussion of general topics, attention is directed to the interpretation of many individual classes of phenomena. The work is rather technical and not oriented to the beginner without supervision. The illustrations are, however, numerous and useful, and include a number of black-and-white aerial photographs.

American Society of Photogrammetry, Manual of Photographic Interpretation, Washington, D.C.: American Society of Photogrammetry, 1960.

This is, as are the other two manuals issued by the Society, a standard work in its field. Early chapters discuss general interpretation principles. Separate chapters are devoted to photographic interpretation in geology, soils, engineering, forestry, wildlife management, agriculture, urban areas analysis, archaeology, and geography. Although much of the material is too technical for general high school use, parts of the manual could be very useful, such as the copious and well-selected photography including many aerial photographs (some in color) and stereograms.

American Society of Photogrammetry, Selected Papers on Remote Sensing of Environment, Washington, D.C.: American Society of Photogrammetry, 1966.

Here is a collection of twenty papers on remote sensing that effectively span inquiry in the field. Virtually all of the papers are, or tend to be, highly technical. A number of disciplines are represented in an area where disciplinary lines become very indistinct.

Avery, T. Eugene, Identifying Southern Forest Types on Aerial Photographs, Asheville, North Carolina: U.S. Department of Agriculture, Southeastern Forest Experiment Station, 1960.

This small booklet was prepared to assist photographic interpreters in recognizing forest types in the southern states. Eight distinct types are presented with both panchromatic and infrared black-and-white illustrations.

Avery, T. Eugene, Interpretation of Aerial Photographs, 2nd edition, Minneapolis, Minnesota: Burgess, 1968.

This is an outstanding textbook on the essentials of aerial photography and is very readable and useful at the high school level. It is one of the few books which incorporates remote sensing along with the more traditional material on physiography, land-use, and military intelligence applications. The preparation of maps from aerial photographs is specifically treated. Ten photographs are reproduced in color and there are 110 printed black-and-white stereograms of a wide variety of physical and cultural features that may be viewed stereoscopically. Exercises follow the first ten chapters on basic procedures, and many could be employed on the high school level.

Avery, T. Eugene, *Forester's Guide to Aerial Photo Interpretation*, U.S. Department of Agriculture Handbook 308, Washington, D.C.: U.S. Government Printing Office, 1966.

This is a rather specialized booklet on the application of aerial photography to forest resources inventory. Basics of photographic interpretation are outlined very briefly. The material would require a more comprehensive, companion text for classroom use.

Baker, Wilfred H., *Elements of Photogrammetry*, New York: Ronald Press, 1960.

The elements of photogrammetry presented in this work emphasize the physical and mathematical principles involved in its study and application. Most of the material is rather technical. Interpretation is not discussed in the book. Designed as a college textbook, the volume might be useful as a reference on the high school level.

Colwell, Robert N., "Remote Sensing of Natural Resources," *Scientific American*, Vol. CCXVIII, No. 1 (Jan., 1968), pp. 54-69.

This article reviews the accomplishments and potentials of remote sensing techniques. Modern methods made possible by new technology in aircraft and space vehicles have significantly increased and accelerated the acquisition of information. The author focuses particularly on the identification and measuring of natural resources.

Colwell, Robert N., "Uses and Limitations of Multispectral Remote Sensing," *Proceedings of the Fourth Symposium on Remote Sensing of Environment* (Ann Arbor, Michigan: Institute of Science and Technology, December, 1966), pp. 71-100; also, Bobbs-Merrill Reprint Series in Geography, G-39.

This paper examines the uses and limitations of multispectral remote sensing through the use of specific examples and analytical discussions of the various factors affecting remote sensing. The paper introduces the scope and meaning of remote sensing as applied to many disciplines.

"Extraordinary Photographs Shows Earth Pole to Pole," National Geographic, Vol. CXXVII, No. 2 (Feb., 1965), pp. 190-192.

Two photographs are presented from the Nimbus I weather satellite taken 500 miles aloft. One is a mosaic of individual photographs taken in a 50 minute pass between the North and South Poles. The traverse includes central U.S.S.R. to eastern Africa. The second photograph displays a remarkably clear picture of Western Europe. The major virtue of this achievement for the student of aerial photography is the nearly instantaneous observation of vast portions of the earth.

Gutkind, Erwin A., Our World from the Air; An International Survey of Man and His Environment, Garden City, New York: Doubleday, 1952.

Here is a photographic survey of the world. Most of the photographs included in the book were taken from the air. Although not written as an introduction to the use of aerial photographs for mapping or analysis, the captioned material could be useful in the high school classroom.

Gwyer, Joseph A. and Vincent G. Waldon, Photo Interpretation Techniques; A Bibliography, Washington, D.C.: U.S. Library of Congress, Technical Information Division, 1956.

Here is a detailed annotated listing of material published between 1935 and 1953. Principles, methods, and application of photogrammetry are covered. A section is devoted to geography with the emphasis on environmental features.

Hallert, Bertil, Photogrammetry; Basic Principles and General Survey, New York: McGraw-Hill, 1960.

The book is intended to present an outline of the fundamental principles of photogrammetry and to illustrate the more important procedures and applications. The mathematical sections are developed in a detailed, careful fashion. Designed as a college textbook, it might be useful as a reference book on the high school level.

Lancaster, Jane, "Geographers and Remote Sensing," *The Journal of Geography*, Vol. LXVII, No. 5 (May, 1968), pp. 301-310.

The article describes and illustrates what remote sensing is, relates it to work in aerial photography, and suggests applications in geographic research. The electromagnetic spectrum is dissected into constituent sensing properties in a simple, direct manner. Material sources of remote sensing application are presented and a summary of current discussion on the means of developing this new range of tools is included.

Lattman, Laurence H. and Richard G. Ray, *Aerial Photographs in Field Geology*, New York: Holt, Rinehart, and Winston, 1965.

This paperback briefly covers the essentials of aerial photographic use and interpretation in a manner that is largely non-technical. Although intended for the geologist, most of the text is equally applicable to geographic work.

Lee, Willis T., *The Face of the Earth as Seen from the Air; A Study in the Application of Airplane Photography to Geography*, New York: The American Geographical Society, 1922.

This is a dated but important work which encouraged a more extensive use of aerial photography in geography. The book contains over eighty aerial photographs with an accompanying descriptive text.

Lowman, Paul D. Jr., "The Earth From Orbit," *National Geographic*, Vol. 130, No. 5 (Nov., 1966), pp. 645-671.

While the text is worthwhile, the article is particularly noteworthy for its reproduction of Gemini space photography. Part or all of 27 photographs are reproduced by the usual National Geographic high quality color printing. Changes in terrain and vegetation stand out dramatically and entire drainage basins and mountain ranges can be observed at once. Small but useful maps pinpoint the location of each photograph.

Lueder, Donald R., *Aerial Photographic Interpretation*, New York: McGraw-Hill, 1959.

This basic survey of the subject emphasizes the use of inductive and deductive scientific methods of inquiry. Part One is devoted to the elements of photographic pattern; Part Two is an exposure to the application of these elements or principles to landform analysis; and Part Three discusses the use of the principles in many fields of learning. This college textbook could be of considerable use to the instructor at the high school level.

Marschner, F. J., Land Use and Its Patterns in the United States, Agriculture Handbook 153, Washington, D.C.: U.S. Government Printing Office, 1959.

Along with a good summary of rural land use in the United States is a set of captioned aerial photographs. A total of 168 photographs illustrate land use over wide areas of the country. Accompanying captions describe these areas and their physical base. Several of the photographs used in this handbook are reprinted earlier in this present reference volume. Suitable high school geography exercises could be developed from the aerial photographs printed in this handbook. This classic volume is unfortunately out-of-print but can be located in major libraries.

Moffitt, Francis H., Photogrammetry, Scranton, Pa.: International Textbook Co., 1959.

This is a textbook treatment of the subject for college instruction. Attention is focused on techniques, measurement, and equipment for photogrammetry. It might be a useful supplementary reference for high school work.

Newell, H. E. and Leonard Jaffee, "Impact of Space Research on Science and Technology," Science, Vol. CLVII, No. 3784 (July 7, 1967), pp. 29-39.

Here is a good account of the potential impact on science and scientific application by the flood of information coming from space research. Implicit in the discussion is the role remote sensing will play in future goegraphical research.

Norberg, William, "Geophysical Observations from Nimbus I," Science, Vol. CL, No. 3696 (Oct. 29, 1965), pp. 559-572.

This is an illustrated, technical review of the performance of the Nimbus weather satellite. Successful relay of good quality pictures by both conventional and infrared equipment promises a valuable measuring and mapping tool with additional development.

Powers, William E. and Clyde F. Kohn, Aerial Photo Interpretation of Landforms and Rural Cultural Features in Glaciated and Coastal Regions, Evanston, Illinois: Northwestern University Studies in Geography, No. 3, Northwestern University, 1959.

This monograph deals with aerial photographic interpretation as an aid to understanding the effects of continental glaciation on the landscape and as a base for human activity. Part I deals with the identification of principal landforms; Part II treats land use; and Part III presents a distinctly geographic method of identification.

Smith, Harold T. U., Aerial Photographs and Their Applications, New York: Appleton-Century, 1943.

This is an early, well illustrated text in the field which presents the basic elements of aerial photographic mapping and interpretation. Although some sections are outdated, most is still quite valid, and the writing is relatively non-technical and readable by advanced high school students.

Spurr, Stephen H., Photogrammetry and Photo-Interpretation, New York: Ronald Press, 1960.

This textbook was designed with foresters in mind. However, the material is of broad interest in a number of disciplines. Parts I and II cover the basics of aerial photography and photogrammetry, Part III deals with mapping, and Part IV examines photographic interpretation. Only Part V discusses photographic applications to forestry. Less technical than many college textbooks on aerial photography, much of the material could be utilized in high school studies.

Stone, Kirk H., "Geographical Air-photo Interpretation," Photogrammetric Engineering, Vol. XVII, No. 5 (Dec., 1951), pp. 754-759; also, Bobbs-Merrill Reprint Series in Geography, G-218.

The close relationships between aerial photographic interpretation and traditional cartographic endeavors are pointed out in this early article. Fundamental uses of aerial photographs, the basic steps in interpretation, and development of techniques are briefly surveyed.

Strandberg, Carl H., Aerial Discovery Manual, New York: John Wiley, 1967.

This laboratory-type college course manual covers the general principles of photo-interpretation, photogeology, and photohydrology. Illustrations are plentiful and they, rather than the text, are of particularly potential value in high school work.

Included are 60 small black-and-white aerial stereograms, ready for use, many with accompanying topographic sheet segments, and 50 other aerial photographs.

United States, Army Corps of Engineers, Photogrammetric Mapping, Washington, D.C.: Department of the Army, 1963.

This is a well illustrated, basic manual on the preparation of maps from aerial photography. Topographic maps are the central theme.

United States, Bureau of the Census, How to Read Aerial Photographs for Census Work, Washington, D.C.: Bureau of the Census, U.S. Department of Commerce, 1947.

This small booklet is somewhat dated, but it does introduce the practice of extracting quantitative data on human activity from aerial photographs.

United States, Department of Agriculture, Economic Research Service, Agricultural Application of Remote Sensing: The Potential from Space Platforms, Agriculture Information Bulletin 328, Washington, D.C.: U.S. Government Printing Office, 1967.

The development of photographic sensors and interpretive techniques to perform a variety of agricultural survey tasks from space are discussed. Very much an exploratory outline, though, an appropriate bibliography of recent materials is appended.

United States, Department of Agriculture, Economic Research Service, Uses of Airphotos for Rural and Urban Planning, Agricultural Handbook No. 315, Washington, D.C.: U.S. Government Printing Office, 1966.

This booklet describes how aerial photographs are made, and how students of photogrammetry and photographic interpretation use them in preparing plans for rural and urban development. Most terms and procedures are defined in a simple, clear fashion, with the emphasis on "how" it is done.

United States, Department of Agriculture, Economic Research Service, Worldwide Use of Airphotos in Agriculture, Agriculture Handbook 344, Washington, D.C.: U.S. Government Printing Office, 1967.

This bulletin grew out of research conducted by the National Aeronautics and Space Administration in which the potential for using the orbital satellite

program for obtaining land-use and other agricultural data was evaluated. A number of world areas at various stages of development are included in this survey.

United States, Department of Agriculture, Soil Conservation Service, *Aerial-Photo Interpretation in Classifying and Mapping Soils*, Agricultural Handbook, 294, Washington, D.C.: U.S. Government Printing Office, 1966.

This handbook discusses in detail the methods and techniques used in making soil surveys from aerial photographs. Illustrations supplement the text on how the surveys are made, identification of phenomena, and evaluated for accuracy.

United States, Department of the Army, *Cartographic Aerial Photography*, Technical Manual No. 5-243, Washington, D.C.: Department of the Army, 1964.

This is a basic training manual which incorporates an introduction to the use of photographs for mapping and a description of uses, technical requirements, and evaluation procedures. The material is rather technical and there is no treatment of interpretation.

United States, National Aeronautical and Space Administration, *Earth Photographs from Gemini III, IV, and V*, Washington, D.C.: U.S. Government Printing Office, 1967.

Here is a collection of 244 extraordinary color photographs of the earth from the Gemini flights. Captions provide orientation and summary statements of dominant features. An appendix lists every photograph taken on all Gemini flights to that date in orbital sequence. Also provided is the geographical location, Greenwich mean time when the photograph was taken, and other technical details.

United States, National Council on Marine Resources and Engineering Development, *United States Activities in Spacecraft Oceanography*, Washington, D.C.: U.S. Government Printing Office, 1967.

Here is a brief summary of the uses of aircraft photographs in oceanography. Sea surface temperatures and currents, sea state, marine biology, data relay and positioning, and geographic analysis of photography are included. A series of matched color photographs and black-and-white analysis plates are used to illustrate the results and suggest future potential in this technology.

Wanless, Harold R., *Aerial Stereo Photographs*, Northbrook, Ill.: Hubbard Scientific Co., 1965.

This manual presents 92 page-size aerial photographs, each with a brief passage of description. Accent is on physical features of the landscape, although 20 of the stereograms used to point out specific physical features also show interesting and varying patterns of rural land use, and six show urban land use. Suitable high school geography exercises could easily be developed around these stereograms.

Weaver, Kenneth, "Space Rendezvous, Milestone on the Way to the Moon," *National Geographic*, Vol. 129, No. 4 (April, 1966), pp. 539-553.

Although the text and most of the pictures are of little value to high school subjects, the article does include colored photographs of the earth from space released by NASA.

Whitmore, George D., Morris M. Thompson, and Julius L. Speert, "Modern Instruments for Surveying and Mapping," *Science*, Vol. CXXX, Instrument Issue (Oct. 23, 1959), pp. 1059-1066.

This article describes and contrasts old methods with new methods in surveying and mapping. Equipment in use at the time the article was written is discussed and the importance of photogrammetry to current work is emphasized.

Teaching Techniques and Classroom Lessons

Allen, Dwight W., "Beginning a Map Study with Myth," *The Journal of Geography*, Vol. LVII, No. 9 (Dec., 1958), pp. 459-463.

An appreciation of the impact of different projections on mythical land masses is obtained in this exercise for ninth graders. Students are given a land mass on one projection and asked to produce it again on a different projection. Distortion is dramatically evident.

Anderzhon, Mamie Louise, *Steps in Map Reading: A Map-Reading Workbook*, Chicago: Rand-McNally, 1960.

This is a very basic, workbook approach to map reading. Simple principles of direction, distance, location, elevation, symbolization, and time are introduced with accompanying exercises.

Arnsdorf, Val E., "Teaching Map-Reading and Geographic Understanding with Projectuals," The Journal of Geography, Vol. LXIII, No. 2 (Feb., 1964), pp. 75-81.

The author outlines the use of map overlays in building geographic understanding and map reading skills. A number of selected overlays are introduced in a test of a planned sequence to determine if a sense of pattern association and if the complexities of interrelated geographic phenomena can be obtained. Tests indicated that this method yields promising results in accelerating the development of map skill and geographic understanding.

Avery, T. Eugene, Interpretation of Aerial Photographs. See Section on Aerial Photographs and Other Remote Sensing.

Bateman, Claire L., "Magnetic Map," The Journal of Geography, Vol. LVI, No. 9 (Dec., 1955), pp. 455-456.

This describes the construction of a special map to illustrate the complexity of the Indian monsoon. Important weather-climate controls are magnetized and may be moved about the map to demonstrate the dynamic interplay of causative factors.

Boggs, S. W. and F. K. Branom, Globe Studies and Uses, Chicago: A. J. Nystrom, 1945.

This booklet contains an introduction to globes, their characteristics, and how to use them to illustrate a lengthy list of earth relationships. A final section is devoted to how the teacher might approach the presentation of basic global principles.

Brown, R. A., "In the Pursuit of Excellence: The Use of Outline Maps," Social Studies, Vol. LII, No. 5 (Oct., 1961), pp. 167-170.

The article discusses the utility of the outline map as a basis for exercises and the development of conceptualizing from a map. The low cost and flexibility from the teacher's standpoint suggests their continued use through all grades.

Burkalow, Anastasia Van, "Teaching Map Projections in Introductory Geography Courses," The Journal of Geography, Vol. LIV, No. 2 (Feb., 1955), pp. 82-88.

This article discusses the use of laboratory exercises on map projections. For each projection, the map grid is contrasted with a global grid for area, shape, scale, and direction. Questions accompany the material.

Colby, Charles C. and Clarence B. Odell (Eds.), Successful Teaching with Maps, Chicago: Denoyer-Geppert, 1961.

Successful teaching through the use of good wall maps is the purpose of this teacher's manual. A number of geographers contribute to a dialogue about basic fundamentals and then proceed to specific world areas of which they have demonstrated insight and interest in their professional careers.

Cummings, Leslie P., "Using Maps and Diagrams More Effectively," Social Education, Vol. XXX, No. 8 (Dec., 1966), pp. 623-626.

The article calls attention to the overcoming of inadequate map reading and map making skills in elementary and secondary schools. Inclusion of map concepts and applications usually taught only to college students can be incorporated into presentations that will stimulate a deductive and inductive approach.

Elam, William W., Herbert H. Gross, and Blanche Quigley, "Equipment, Materials, and Sources," Chapter 3, A Handbook for Geography Teachers, Edited by Robert E. Gabler, Normal, Illinois: National Council for Geographic Education, 1966, pp. 20-78.

In a discussion of equipment, materials, and their sources, the writers explore the nature and range of globe and map utilization in the classroom. Attention is directed to how such materials can improve classroom instruction. In addition, sources of materials are listed by type and address of the supplier.

Espenshade, Edward B. Jr., "Verbalization from Maps," The Journal of Geography, Vol. LXV, No. 1 (Jan., 1966), pp. 12-19.

Here is a clear statement on how the map as a fund of information and hypotheses can be introduced to the student. The nature, meaning, and types of map presentation can be introduced to, and exploited by, the student provided that care is exercised in the preparation and organization of material.

Fernald, Edward A., "Aerial Photographs: A Tool for Teaching High School Geography," The Journal of Geography, Vol. LXVII, No. 3 (March, 1968), pp. 147-151.

The article describes one method of using aerial photographs in a ninth grade geography class. After familiarizing the class with the many uses of aerial photographs, stereo-pairs are introduced and provocative questions raised. Then, maps are prepared from the images, land-use changes are explored, and finally, a written exercise is used which requires the developments of inferences from the experience.

Floyd, Barry N., "Landscapes from the Air," The Journal of Geography, Vol. LXV, No. 3 (March, 1966), pp. 125-128.

Here is a discussion of the rewards and potential of aerial photographs as a teaching aid. The author emphasizes the need for a carefully organized approach when employing this tool. Complexity and quantity of information contained on an aerial photograph can create confusion if the presentation is not systematically articulated.

Forsyth, Elaine, Map Reading: A Series of Lessons for Use in the Junior High School, Normal, Illinois: Geographic Education Series No. 1, National Council for Geographic Education, 1964.

This booklet introduces in an elementary fashion the earth grid, scale, distortion, and some common projections. A final section provides a selection of questions to measure map-reading skills of junior high students.

Garvier, B. J., Practical Work in Geography. See Section on Maps and Mapping.

Geography and Educational Media, Topics in Geography No. 3, Normal, Illinois: National Council for Geographic Education, 1967.

Articles in this booklet are reprints from the May, 1967, issue of The Journal of Geography. Several are specifically directed to map usage and map analysis as well as classroom presentation techniques.

Grassell, E. Milton, "Let's Use Maps and Globes," Catholic School Journal, Vol. LXIV, No. 5 (May, 1964), p. 41.

Here is a brief statement on the merits of globes as an important teaching aid in social studies. The writer suggests that globe exercises using chalk should occur frequently in the classroom.

Greco, Peter V., "Inquiry Through Comparative Map Analysis," *The Journal of Geography*, Vol. LXVI, No. 5 (May, 1967), pp. 213-217.

The author attempts to integrate comparative map analysis into a general concept of learning. He suggests that a series of wall maps presenting topical variations in the same area be used to stimulate hypotheses about the relatedness of phenomena. This type of comparative analysis is judged to be the basis for an open dialogue in the classroom between student and map.

Gritzner, Charles F. and Philip B. Larimore, "Educational Media Available to the Teacher of Geography," *Social Education*, Vol. XXX, No. 8 (Dec., 1966), pp. 620-623.

The authors outline a procedure to aid in the elimination of classroom inattention, stimulate participation, and expand the teacher's ability to communicate. Among the media described is the manipulative map which is inexpensive, flexible, and involves the students directly in design, selection of mapped phenomena, and critical appraisal.

Harris, Chauncy D. and George E. McDowell, "Distorted Maps, A Teaching Device," *The Journal of Geography*, Vol. LIV, No. 6 (Sept., 1955), pp. 286-289.

A teaching aid is presented in the form of a carefully prepared map distortion. The method combines the visualization of comparative magnitude of some phenomenon with relative position by maintaining unit-area shape while varying size. States are weighted by population for size, and shape is retained in the illustration.

Harris, Ruby M., *The Rand McNally Handbook of Map and Globe Usage*, Chicago: Rand-McNally, 1960.

This handbook was prepared for teachers. Map concepts, skills, and tools for classroom use are outlined for various grade levels and types of materials. The emphasis is on how to communicate basic concepts with illustrations. Factual material and suggested questions are provided.

Heimomen, Henry S., "A Laboratory Exercise in Aerial Photo Interpretation," The Journal of Geography, Vol. LVI, No. 6 (Sept., 1957), pp. 286-290.

Following a short inventory of information available from aerial photographs, the author advances three exercises in measurement and interpretation. Determination of photo scale, making measurements, and interpretation of cultural change are briefly outlined.

Heppell, Roger C., "Some Map Concepts for High School Social Studies," Social Studies, Vol. XLVIII, No. 7 (Nov., 1957), pp. 249-252.

The writer offers a systematic manner in which to introduce and integrate maps into social studies material. Orientation on the earth, meaning of color symbolization, grid location, and distortion are covered.

Hirt, Howard F., "Reducing Distortion: A Useful Approach in Augmenting the Understanding of Map Projections," The Journal of Geography, Vol. LIX, No. 7 (Oct., 1960), pp. 308-313.

This article describes a method used to demonstrate the ways in which projections can be adapted or changed so that distortion is minimized while good map qualities are preserved. The method is advanced as one in which the student increases his grasp of criteria for the selection or evaluation of a map projection.

Hovey, Howard, Elements of Mathematical Geography, Saginaw, Michigan: Trippensee Planetarium Co., 1949.

This is a handbook for school and home use which explains the use of the Trippensee Planetarium. Basic sun, earth, and moon relationships are demonstrated along with a set of questions for examining the grasp of the basic principles.

Hoefer, John N. and Bernard G. Hassemer, "State Study Through Map Interpretation," The Journal of Geography, Vol. LVII, No. 1 (Jan., 1958), pp. 13-17.

A method where student-prepared maps were employed as an aid in grasping geographical relationships is outlined. Preparation of a series of topical maps, and then contrasting them, involved the students in critical interpretation of spatial interrelationships.

Howett, Lillian C., "The Map in the Social Studies," *High Points*, Vol. XXXIX, No. 8 (Nov., 1957), pp. 73-78.

This essay points out the crucial role of the map in social studies teaching. Junior high class procedures are suggested along with a reasonably detailed outline of material and concepts to advance in sequence.

James, Linnie B. and La Monte Crape, *Geography for Today's Children*, New York: Appleton-Century-Crofts, 1968, pp. 33-128.

This work, directed to the geography teacher, includes a discussion on the introduction and reading of maps. The material is clearly written with an emphasis on environmental factors. Unfortunately, the volume, though new, is not well illustrated.

Kennamer, Lorrin, "Developing a Sense of Place and Space," *Skill Development in Social Studies*, Edited by Helen McCracken Carpenter, Washington, D.C.: Thirty-third Annual Yearbook, National Council for the Social Studies, 1963, pp. 148-170.

Within a framework of geographic contributions to social studies, the author summarizes the importance of integrating fundamental spatial concepts. Capabilities to be developed in students are classified by grade level.

Kennamer, Lorrin, "Visualization of Latitude and Longitude," *The Journal of Geography*, Vol. LXI, No. 1 (Jan., 1962), pp. 9-11.

The author advances a method for teaching latitude and longitude by using a carefully partitioned styrofoam ball. A three-dimensional visual is judged to be much more effective in gaining student comprehension.

Kohn, Clyde F., "Media and Techniques for Geography Education," *Curriculum Guide for Geographic Education*, Edited by Wilhelmina Hill, Normal, Illinois: National Council for Geographic Education, 1964, pp. 107-134.

In this description of audio-visual instructional materials and techniques, maps, globes, and models are treated. Recent advances in the types and quality of teaching aids have expanded the range of alternatives for the teacher.

Laatsch, William G., "Making Maps Meaningful," The Journal of Geography, Vol. LXV, No. 9 (Dec., 1966), pp. 416.

This statement favors the inductive approach when teaching map appreciation. The author reports very briefly on a three week unit in which students relied exclusively on non-text materials including maps, globes, and films. Results were judged to be excellent.

Larimore, Philip B. and Charles F. Gritzner, "Creating Visual Impressions: Using Media in Geography," Audiovisual Instruction, Vol. XI, No. 5 (May, 1966), pp. 349-352.

This article suggests the need for a well developed implementation of visuals, especially maps, into classroom presentation. It reports a type of display used in a NDEA summer institute. It emphasizes the flexibility and excellent results that may be obtained from employing a manipulative map.

Marsh, Susan, All About Maps and Mapping, Eau Claire, Wisconsin: E.M. Hale, 1963.

The book is designed to introduce maps and mapping to students. Portions of the exercise material could be used on the high school level. Illustrations are generally good. Basics of measurement, orientation, compilation, and drafting are covered.

Marschner, F. J., Land Use and Its Patterns in the United States. See Section on Aerial Photography and Other Remote Sensing.

McDermott, Paul D., "Map Use in Our Schools," The Journal of Geography, Vol. LXVI, No. 2 (Feb., 1967), pp. 74-78.

The author inquires, criticially, into the causes which explain the inadequate exposure of students to map learning. Problem areas singled out include teacher preparation, budgets, cost of materials, negative map characteristics, and the information quality of maps.

McKinney, William M., Geography Via Use of the Globe, Do It This Way Series, Normal Illinois: National Council for Geographic Education, 1965.

This booklet introduces the globe as an essential teaching aid. The physical characteristics of globes, the earth grid and location, the earth as a spatial body, and its orientation in the solar system explaining seasons, illumination, the length of day and night, and time are presented in a well illustrated, systematic manner.

McKinney, William M., "Maps and Globes in Earth Space Relations," The Journal of Geography, Vol. LXVI, No. 9 (Dec., 1967), pp. 481-488.

This article focuses on the need to strengthen instruction about the earth as a planet and the role of maps and globes in such a presentation. Several map projections are illustrated in a discussion of their nature and construction.

McNee, Robert B., "On the Value of Sketch Maps," The Journal of Geography, Vol. LIV, No. 8 (Nov., 1955), pp. 416-417.

Here is a brief appeal for greater classroom use of sketch maps. The author points out that they are easy to make, require a minimum of equipment, and provide the ultimate in geographic simplification.

Miller, Elbert E., "Map Reading Abilities of College Freshman Compared With Those of Ninth Graders," The Journal of Geography, Vol. LXIV, No. 8 (Nov., 1965), pp. 367-372.

A comparison of scores on a standardized test of map-reading ability between college freshmen and ninth graders was undertaken to evaluate the gains made in the intervening years. Test results verify that map-reading skills do increase but not as much as expected for the grade interval. Map-reading ability appears to be skill acquired through formal instruction rather than travel, and correlates closely with other achievement measures.

Odell, Clarence B., "The Use of Maps, Globes, and Pictures in the Classroom" New Viewpoints in Geography, Edited by Preston E. James, Washington, D.C.: Twenty-Ninth Annual Yearbook, National Council for the Social Studies, 1959, pp. 200-210.

This article suggests a basis for a more effective use of pictures, globes, and maps in the classroom. A planned program of use, with the "why" being the dominant theme, is singled out.

Pattison, William D., "Teaching Map and Globe Skills," The Instructor, Vol. LXXV, No. 8 (April, 1966), p. 37.

This article presents a brief outline of the sequence in which maps and globes could be presented in the classroom. A carefully graded series of five levels with increasing complexity would follow from kindergarten through high school.

Richason, Benjamin F. Jr. and Carl E. Guell, Geography Via Aerial Field Trips, Do It This Way Series, Normal, Illinois: National Council for Geographic Education, 1965.

Aerial fieldtrips as an aid to geographical comprehension are outlined in this excellent monograph. This approach could enjoy application at any academic level and could serve as a compliment to map and aerial photograph use and to make both more meaningful.

Scarfe, Neville V., "Aids to Teaching," Chapter 9, Geography in School, Geographic Education Series No. 5, Normal, Illinois: National Council for Geographic Education, 1965, pp. 70-84.

In a section devoted to teaching aids, the author includes an incisive critique on the more efficient use of maps. Maps constructed by the class, map detail, and presentations are integrated with other teaching aids.

Scovel, James L., Emmett J. O'Brien, M. C. McCormack, and R. B. Chapman, Atlas of Land Forms, New York: John Wiley, 1965.

Topographic maps (in color), ground photographs, oblique and vertical aerial photographs, diagrams, other graphic materials, and a brief accompanying text are used to illustrate and explain a wide variety of landforms. The atlas was developed at the U.S. Military Academy at West Point and is a remarkably effective presentation with which many kinds of student exercises can be developed. Included are 65 black-and-white stereograms (mostly stereotriplets), many with accompanying U.S.G.S. maps.

Silvernail, Richard, "Aerial Photography in Secondary Schools," The Journal of Geography, Vol. LXVI, No. 5 (May, 1967), pp. 250-252.

A strong case is advanced for expanded use of aerial photographs in the classroom. They can be a rewarding compliment to maps as they demonstrate the complex reality that maps necessarily generalize. An approach for classroom incorporation is described on this theme.

Strandberg, Carl H., *Aerial Discovery Manual*. See Section on *Aerial Photography and Other Remote Sensing*.

Statistics for Geography Teachers, Topics in Geography No. 2, Normal, Illinois: National Council for Geographic Education, 1967.

This volume of summary numerical topics in geography contains material on scale, measurement, the map grid, and time that could be useful to both the instructor and student of maps in the secondary school.

Switzer, Wilbur J., "The Map Exercise as a Basis for Critical Thinking in High School Geography," *The Journal of Geography*, Vol. LIX, No. 7 (Oct., 1960), pp. 314-316.

The concern here is the neglect of map use as an essential ingredient in critical geographical thinking. One of the goals, suggests the author, in any introductory geographic work is fundamental attention to maps by way of well conceived exercises.

Toward Better Understanding and Use of Maps-Globes-Charts, Chicago: Denoyer-Geppert, 1963.

This is a teacher's manual for better use of maps, globes and charts in geography or social studies. A number of scholars suggest approaches to be employed in the classroom, as well as criteria for evaluating performance.

Wanless, Harold R., *Aerial Stereo Photographs*. See Section on *Aerial Photography and Other Remote Sensing*.

Young, Robert N., "Notes on a Program of Field Mapping for Undergraduates," *The Journal of Geography*, Vol. LV, No. 3 (March, 1956), pp. 149-151.

This article reports on a field mapping project in which students completed a land-use survey and mapping problem. The goal of this approach is an understanding of complex, physical-cultural and land-use relationships.

2. FILMSTRIPS, SLIDES, AND MOTION PICTURE FILMS

Good filmstrips, slides, and motion pictures on maps, mapping, and aerial photography suitable for high school level audiences are very few. While a selection of filmstrips and films is given here, this should not be considered a recommended list. Many are designed for use in primary or intermediate grades, and their use for a high school audience may not be satisfactory. The high school geography teacher should preview carefully any filmstrips or films before classroom use. Refer to Section 6 of this booklet for map transparencies used on overhead projectors.

Filmstrips

A few filmstrips on map interpretation and use are available. These filmstrips, 30 to 60 frames each, are, for the most part, designed for use in lower grades and would be useful for the high school level only for remedial learning or review purposes. Some of the filmstrips released by the National Film Board of Canada, listed below, might be suitable for high school use. All the filmstrips listed are for sale, and addresses of producers are given in Section 10 of this booklet.

How to Use Maps and Globes, six filmstrips (about 36 frames each), color, available from Stanley Bowmar Co.

A series designed to teach the principles of maps and map reading including: Maps: What They Are; Map Symbols and Terms; Globes: Our Most Accurate Maps; Maps: Their Types and Uses; Latitude and

Longitude--Find Places and Directions; Latitude and Longitude--Time Zones and Climate.

Introducing Map Scale, 36 frames, color, available from Stanley Bowmar Co.

Explains scale measurements and shows how information and symbols used on a map depend upon scale to which they are drawn.

Introducing Map Scale, 36 frames, color, Nat'l. Film Board.

A filmstrip designed for military use but suitable also for high school instruction which shows how information given on a map and the symbols used to express it depend on the scale to which the map is drawn. Illustrations are in the form of artwork, diagrams and aerial photographs.

Introducing the Topographical Map, 58 frames, color, Nat'l. Film Board.

This filmstrip illustrates how the physical features of the earth's surface are represented on the topographical map, and how symbols are made to correspond to land surface, vegetation, drainage, and man-made features so that an accurate picture may be given of any area.

Introduction to Maps, 30 frames, color, Nat'l. Film Board.

This filmstrip illustrates, in simple story form for children, how maps are made and how they can represent a few streets, a community, a continent, and even the whole world.

Learning to Use Maps, six filmstrips (about 47 frames each), color, Filmstrip Series No. 8520, Ency. Britannica Films.

This filmstrip series provides a step-by-step approach to understanding what a map is, how it is made, and what it can tell us. The teacher will find these clear drawings and examples of different types of maps useful in introducing the concepts of measurement, direction, scale, parallels and meridians, and symbols basic to map reading. Titles are: Reading Direction on Maps, Measuring Distances on Maps, Locating Places on Maps, Reading Physical Maps, Reading Political or Economic Maps, and Studying and Area Through Maps.

Map Orientation, 36 frames, color, Nat'l. Film Board.

Designed primarily for military personnel but suitable also for high school use, this filmstrip illustrates "map orientation" and shows how to go about "setting" a map in various situations.

Map Symbols, Dots and Lines, 60 frames, color. Soc. for Visual Educ.

Discusses symbols as a means of visualizing a region. Geographic terms such as river, swamps, and irregular coastline, are explained by means of maps.

Using Maps and Globes, 48 frames, color, Soc. for Visual Educ.

A systematic development of map and globe concepts with special emphasis on direction, distance and latitude.

Slides

Slides reproducing black-and-white aerial photographs which illustrate representative landform features of the United States are available from Purdue University. Slide size is 3 1/4" X 4" and each is priced at $2.00. For listing of slides available, write:

Director
Air Photo Interpretation and Photogrammetry Laboratory
School of Civil Engineering
Purdue University
West Lafayette, Indiana 47906

Slides of NASA space photography taken on the various Gemini flights are available in several sizes from:

Still Photo Productions, Inc.
Technology Application Center
University of New Mexico

Further information and addresses are given in Section 8 of this booklet under Space Photography. Sources of map transparencies for use on overhead projectors are given in Section 6 of this booklet.

Government Films

A number of motion picture films on cartography and aerial photography which have been produced or sponsored by U.S. or other government agencies are available on loan. Some are excellent. All are 16 mm. sound films and are furnished without rental charge. In some cases, such as films from the U.S. Army and U.S. Air Force, special request forms must be secured and submitted. Addresses for government agencies follow this listing of their films. Write for information and ordering procedure before requesting specific films.

Aerial Photo Interpretation of Forest Resources, 39 min., color, Pan Amer. Inst./AID.

Illustrates how the techniques of photographic interpretation are used to assist in the discovery and evaluation of the forest resources of an area.

Aerial Photo Interpretation of Geological Resources, 34 min., color, Pan Amer. Inst./AID.

Illustrates how the techniques of photographic interpretation are used to assist the geologist in the discovery and evaluation of resources such as minerals, fuels, and construction materials.

Aerial Photo Interpretation of Hydrological Resources, 39 min., color, Pan Amer. Inst./AID.

Provides training in the techniques of photographic interpretation in the discovery and evaluation of the hydrological resources of a country or region.

Aerial Photo Interpretation of Soil Resources, 36 min.,color, Pan Amer. Inst./AID.

Shows how soil surveys are expedited by the use of photographic interpretation. It points out that proven techniques in this field combined with a limited amount of field work make possible a general evaluation of the soil resources of a region quickly and economically.

Basic Map Reading: Azimuth, 5 min., black-and-white, TF 5-2406, U.S. Army.

Explained is how azimuth is used to reach a city street destination. Definitions and examples of azimuth, azimuth circle, and back azimuth are included.

Basic Map Reading: Azimuth Conversion, 5 min., black-and-white, TF 5-2407, U.S. Army.

Discussed is how the grid azimuth is converted to magnetic azimuth to determine a "path" to an objective; conversion of magnetic to grid azimuth.

Basic Map Reading: Characteristic of Contour Lines, 6 min., black-and-white, TF 5-2408, U.S. Army.

Explained is how to read contour lines denoting uniform, gentle, steep, concave, and convex slopes, valleys, stream junctions, cuts and fills.

Basic Map Reading: Contour Lines and Intervals, 5 min., black-and-white, TF 5-2409, U.S. Army.

The subject is how to read the contour interval and contour lines to determine shape and elevation of land. Examples of lines denoting steep hills and gentle slopes are included.

Basic Map Reading: Direction, 4 min., black-and-white, TF 5-2410, U.S. Army.

Included are definitions of and differences between true north, magnetic north, and grid north; use of declination diagram to determine which north is desired.

Basic Map Reading: Elevation, 5 min., black-and-white, TF 5-2411, U.S. Army.

Treated are methods used to indicate elevation, including contour lines and hachures on maps, form lines on aerial photographs, ridge and stream lines on maps and photographs, and layer tints on maps and charts.

Basic Map Reading, Part I--Topographic Symbols, 18 min., black-and-white, TF 5-1788, U.S. Army.

This training film explains how to identify natural and cultural ground features by representative topographic map symbols.

Basic Map Reading, Part II--Elevation, Distance, and Grid, 27 min., black-and-white, TF 1789, U.S. Army.

Shows how to interpret contour lines in terms of measuring height and determining character of slopes; how to measure distances by map and graphic scales.

Basic Map Reading, Part III--Direction, Orientation, and Location with Compass, 33 min., black-and-white, TF 5-1791, U.S. Army.

Illustrates how the compass is used to orient the map.

Basic Map Reading, Part IV--Direction, Orientation and Location without Compass, 21 min., black-and-white, TF 5-1790, U.S. Army.

Step-by-step explanation for determining direction, orientation, and location without a compass are provided.

Basic Map Reading, Part V--Photos and Photomaps, 23 min., black-and-white, TF 5-1792, U.S. Army.

This film shows how to identify terrain features on photographs and identify objects by size, shape, shadow, relative tone, and relation to surrounding features.

Basic Map Reading: Percent of Slope, 7 min., black-and-white, TF 5-2414, U.S. Army.

Discussed are how to compute vertical and horizontal distances on the field and on a map, applying formula for finding percent of slope.

Basic Map Reading: Resection, 7 min., black-and-white, TF 5-2415, U.S. Army.

Explained is how to locate an unknown position by the resection method; taking sights on two identifiable reference points; computing back azimuth.

Basic Map Reading: Scale and Distance, 5 min., black-and-white, TF 5-2416, U.S. Army.

Covered in this film is how to determine scale and distance by use of representative fraction and graphic scale.

Basic Map Reading: Using the Protractor, 5 min., black-and-white, TF 5-2417, U.S. Army.

This describes use of protractor to find the azimuth or "street" along with which to travel to reach a destination.

Charts, 18 min., black-and-white, U.S. Navy (rental available from Indiana University Audio-Visual Center).

Pictures, maps, diagrams, and commentary explain the Mercator projection, gnomonic projection, and Lambert conformal projection.

The Earth, 16 min., black-and-white, U.S. Navy (rental available from Indiana University Audio-Visual Center).

Explains in a non-technical way the positions and significances of the lines of latitude and longitude on the earth.

The Giant Step, 30 min., color, SFP 1449, U.S. Air Force.

Explained is the 1370th Photo Mapping Wing's exacting work in making aerial surveys in the free world. Includes a history of cartography using early maps and points out the necessity of accurate maps for national economic development.

Grid Navigation--Introduction and Theory, 12 min., black-and-white, TF 1-5227a, U.S. Air Force.

This film explains basic aerial navigation and use of grid procedures in overcoming problems of polar navigation. Subjects discussed include the Earth's converging meridians, the grid overlay, and calculations in Western and Eastern hemispheres.

Introduction to Photo Interpretation, 22 min., color, Pan Amer. Inst./AID.

Provides training in the techniques of photographic interpretation for the discovery and evaluation of the natural resources of a country or region.

Multiplex Mapping, Part I, 26 min., color, TF 5-1549, U.S. Army.

This is a technical film which describes the multiplex method of producing accurate topographical maps from aerial photographs.

Pathways in Aerospace, 25 min., color, SFP 1216, U.S. Air Force.

This film briefly describes the work and the mapping products of Aeronautical Chart and Information Center. Includes the importance of maps and mapping, use of aerial photographs, preparation of lunar charts, and uses of charts in air navigation.

Pathways to Progress, 25 min., color, SFP 1223, U.S. Air Force.

This film depicts the world-wide photographic and charting responsibilities of the Air Force. Scenes of field operations throughout the world are shown and discussed.

Story of the U.S. Lake Survey, 29 1/2 min., color, U.S. Lake Survey.

This film shows the historical development of Lake Survey activities in the production of navigation charts of the Great Lakes and related activities, such as measurement of the water levels of the Great Lakes. Present charting methods are emphasized. The geologic history and economic development of the Great Lakes are briefly traced.

Government agencies from which the above films may be borrowed are listed below:

Pan American Inst. of Geography and History/Agency for International Development Films:

The Information Office
U.S. Geological Survey
Washington, D.C. 20242

U.S. Air Force Films:

USAF Film Library Center
8900 South Broadway
St. Louis, Missouri 63125

U.S. Army Films:

If you live in--	Write to--
Maine, New Hampshire, Vermont, Rhode Island, Connecticut, New Jersey, New York, and Massachusetts	First Army Governors Island New York, New York 10004
Pennsylvania, Maryland, Virginia, Ohio, West Virginia, Kentucky, and Delaware	Second Army Ft. George G. Meade Maryland 20755
North Carolina, South Carolina, Georgia, Florida, Alabama, Tennessee, and Mississippi	Third Army Ft. McPherson Georgia 30330
Arkansas, Texas, Oklahoma, New Mexico, and Louisiana	Fourth Army Ft. Sam Houston Texas 78234
Illinois, Michigan, Wisconsin, Missouri, Kansas, Indiana, Iowa, Nebraska, Minnesota, North Dakota, South Dakota, Wyoming, and Colorado	Fifth Army 1660 East Hyde Park Boulevard Chicago, Illinois 60615

Washington, Oregon, Idaho, Montana, Utah, Nevada, Arizona, and California	Sixth Army Presidio of San Francisco San Francisco, California 94129
District of Columbia and Greater Washington area	Military District of Washington Washington, D.C. 20025

U.S. Lake Survey Film:

District Engineer
U.S. Army Engineer District
Lake Survey
630 Federal Building
Detroit, Michigan 48226

Commercial Films

Very few commercial films on map interpretation and use are truly suited for high school students although some films may have value for remedial learning purposes. A small selection is presented here. All are 16 mm. sound films and most may be purchased from the producer or rented from regional film libraries. Addresses of manufacturers and other sales agencies are given in the final section of this booklet; addresses of regional film libraries follow in this section.

Beginnings: Edward Espenshade, Jr., Cartographer, 29 min., black-and-white, National Educational Television (available from Indiana University Audio-Visual Center).

Explains the use of maps to secure information and discusses mapmaking. Indicates types of information contained on maps and predicts the mapping of outer space as rocketry expands.

Global Concepts in Maps, 11 min., color, Coronet Films.

How map projections for global representations have been designed and improved to meet different uses in the changing world are shown in this film. A simple demonstration of the great circle routes on a polar projection introduces cylindrical, conic, and perspective projections--with a summary of the practical application of each.

Globes: Their Function in the Classroom, 14 min., color, Bailey Films (available from Indiana University Audio-Visual Center and other rental libraries).

Depicts the types of globes available for elementary and secondary school classrooms, varying from simple readiness globes to complex celestial globes. Illustrates various specific uses of different kinds of globes. Stresses the importance of following a graded globe program and correlating globes with appropriate flat maps and related materials.

The Language of Maps, 11 min., color, Ency. Britannica Films.

Combines aerial photography with topographic models and several different kinds of maps to show that the language of maps is made up of symbols representing natural and man-made features of a given area of the earth's surface.

Latitude and Longitude, 9 min., color, Gaumont-British (available from Indiana University Audio-Visual Center and other rental libraries).

Interprets latitude and longitude as angular distances from given points. Indicates how a position can be determined by latitude and longitude, and uses a sectional globe to show the relationship between angles subtended at the center of the globe or at the axis and linear distance on the surface of the globe.

Maps and Their Meaning, 14 min., color, Academy Films.

This film explains and visualizes the different colors of a physical map and indicates the type of land found in each of the color zones. The important effects of altitude, latitude, and rainfall upon man's use of the land are also discussed.

Maps and Their Uses, 11 min., color, Coronet Films.

A variety of maps is presented in this film to introduce the study of special symbols on maps. How to read a map is shown by describing a scale of distances, a grid and legend. The many uses of maps point out their importance in everyday living.

Maps: An Introduction, 12 min., color, Indiana University Audio-Visual Center.

Describes how maps are made by picturing a class constructing a map from a model of the community. Shows the use of a legend and how a scale is derived in order that distance may be measured on the map. Illustrates the way a community can be located on county, state, and U.S. maps, and on a world globe.

Maps--Coastal Symbols and Terms, 14 min., color, Academcy Films.

This film shows how coastline formations are represented on maps and how these formations actually appear along 4900 miles of the coastline of the United States. Because distances are great, wide-angle high altitude aerial photographic views are used to acquaint learners with long stretches of Atlantic, Gulf, and Pacific Coastal areas.

Maps for a Changing World, 11 min., black-and-white, Ency. Britannica Films.

Traces the history of map concepts as they relate to exploration and improved methods of transportation. The inadequacy of Mercator, elliptical, and "split-orange" maps for modern air travel is pointed out. A north polar projection is suggested as the most useful map for today's requirements, but future space travel will soon influence new changes in map construction.

Map Skills: Using Different Maps Together, 11 min., color, Coronet Films.

Pictures various ways different maps can be used together to convey geographical relationships. Compares maps showing rainfall, industry, transportation, population, and physical features. Shows that information from these maps can be combined to give a more meaningful picture of the geography of a region.

Maps--Land Symbols and Terms, 14 min., color, Academy Films.

Aerial photography of representative areas of the United States is used in explaining how to interpret land symbols and terms which appear in map legends. These diagrammatic representations identify cities, boundary lines, major water courses and bodies of water, rail lines, etc. for the map-reader.

Reading Maps, 11 min., color, Ency. Britannica Films.

> Through familiar situations and aerial photography, maps are drawn in a language of signs that stand for physical features. Film demonstrates the value of the legend, the scale, the direction symbol and the title in the making and reading of maps.

Using Maps, 11 min., color Ency. Britannica Films.

> Visually defines a map and shows several ways of measuring distance. Emphasizes the concept of map scale and illustrates how distance on a map is measured by using a map scale.

Rental Film Libraries

Commercially produced and some government produced 16 mm. motion picture films on map and aerial photographic use and interpretation are available for rental at moderate prices from the sources listed below. Information on films available and orders for rental bookings should be requested directly from your nearest film library.

ALABAMA

Audio-Visual Aids Service, Extension Division, Univ. of
Alabama, University 35486

ARIZONA

Northern Arizona Film Library, Northern Arizona
University, Flagstaff 86001

Audio-Visual Center, Arizona State Univ.
Tempe 85281

Bureau of Audiovisual Services, Univ. of Arizona
Tucson 85721

ARKANSAS

Audio-Visual Section, Arkansas State Teachers College
Conway 72032

Audio-Visual Center, Arkansas State College
State College 72467

CALIFORNIA

University Extension, University of California
Berkeley 94720

Craig Corporation, 3410 South LaCienega Boulevard
Los Angeles 90016

Craig Corporation, 215 Littlefield Avenue
S. San Francisco 94080

COLORADO

Bureau of Audiovisual Instruction, University Extension Division
University of Colorado
Boulder 80302

Instructional Materials Center, Colorado State College
Greeley 80631

CONNECTICUT

Audio-Visual Center, University of Connecticut
Storrs 06268

DISTRICT OF COLUMBIA

Paul L. Brand & Son, 2153 K Street, North West
Washington 20037

FLORIDA

Educational Media Center, Florida State University
Tallahassee 32306

GEORGIA

Georgia Center for Continuing Education, University of Georgia
Athens 30601

IDAHO

Audio-Visual Services, Idaho State University
Pocatello 83201

ILLINOIS

Educational Film Library, Northern Illinois University
DeKalb 60115

Audio-Visual Service, Southern Illinois University
Carbondale 62901

Visual Aids Service, University of Illinois
704 South Sixth
Champaign 61822

Ideal Pictures, 417 North State Street
Chicago 60610

INDIANA

Audio-Visual Center, Indiana University
Bloomington 47401

IOWA

Visual Instruction Service, Iowa State University of Science and Technology
Ames 50010

Audiovisual Center, University of Iowa
Iowa City 52240

KANSAS

Bureau of Visual Instruction, University Extension, University of Kansas
Lawrence 66045

KENTUCKY

Audio-Visual Services, University of Kentucky
Lexington 40506

MAINE

Audio-Visual Center, University of Maine
Orono 04473

MARYLAND

Kunz, Inc., 426 North Calvert Street
Baltimore 21202

MASSACHUSETTS

Abraham Krasker Memorial Film Library
Boston University, School of Education
765 Commonwealth Avenue
Boston 02215

Ideal Pictures, 42 Melrose
Boston 02218

MICHIGAN

Audio-Visual Education Center, University of Michigan,
Frieze Building
720 East Huron
Ann Arbor 48104

MINNESOTA

Audio-Visual Extension Service, General Extension Division
University of Minnesota
2037 University Avenue, S.E.
Minneapolis 55455

MISSISSIPPI

Audio-Visual Education, School of Education,
University of Mississippi
University 38677

MISSOURI

Audio-Visual Center, Southeast Missouri State College
Cape Girardeau 63701

University Extension Division, 119 Whitten Hall
University of Missouri
Columbia 65201

MONTANA

Audiovisual and Library Services, State Department of Public
Instruction
Helena 59601

NEBRASKA

Bureau of Audio-Visual Instruction, University Extension
Division
University of Nebraska
Lincoln 68508

NEW HAMPSHIRE

Audio-Visual Center, University Extension, University of
New Hampshire
Durham 03824

NEW MEXICO

Film Library, Eastern New Mexico University
Portales 88130

NEW YORK

Alden Films, 5113-16th Avenue
Brooklyn 11204

Educational Film Library, State University College at Buffalo
1300 Elmwood Avenue
Buffalo 14222

Film Library, Collendale Campus, Syracuse University
1455 East Colvin Street
Syracuse 13210

NORTH CAROLINA

Bureau of Audio-Visual Education, University of North Carolina
Chapel Hill 27514

NORTH DAKOTA

Film Library, Division of Supervised Study, State
University Station
Fargo 58102

OHIO

Church School Pictures, 1118 Walnut
Cleveland 44114

Twyman Films, Inc., 329 Salem Avenue
Dayton 45406

Audio-Visual Services, Kent State University
210 Education Building
Kent 44240

M. H. Martin Co., 1118 Lincoln Way East
Massillon 44646

OKLAHOMA

Extension Division, Educational Materials Services,
Audio-Visual Education
University of Oklahoma
Norman 73069

Audio-Visual Center, Oklahoma State University
Stillwater 74074

OREGON

Audiovisual Instruction, Division of Continuing Education
Coliseum 131
Corvallis 97331

PENNSYLVANIA

J. P. Lilley & Son, Inc., 928 North Third Street
Harrisburg 17105

Indiana Film Service, Indiana University of Pennsylvania
Indiana 15701

Audio-Visual Aids Library, Pennsylvania State University
University Park 16802

L. C. Vath Audio-Visual Aids, 449 North Hermitage Road
Sharpsville 16150

SOUTH CAROLINA

College of General Studies and Extension, Audio-Visual Division
University of South Carolina
Columbia 29208

SOUTH DAKOTA

Film Library, South Dakota State University
Brookings 57006

Film Library, Extension Division, University of South Dakota
Vermillion 57069

TENNESSEE

Peabody Learning Resources Center, George Peabody College for Teachers
Nashville 37203

TEXAS

Visual Instruction Bureau, Division of Extension, University of Texas
Austin 78712

UTAH

Educational Media Services, Instructional Materials, Brigham Young University
Provo 84601

Educational Media Center, University of Utah
207 Bennion Hall
Salt Lake City 84112

WASHINGTON

Audio-Visual Library, Central Washington State College
Ellensburg 98926

Audio-Visual Center, Washington State University
Pullman 99164

Craig Corporation, 540 South Front Street
Seattle 98108

Audio-Visual Services, University of Washington
Seattle 98105

WISCONSIN

Film Library, Audiovisual Center, Wisconsin State University
LaCrosse 54601

Bureau of Audio-Visual Instruction, University of Wisconsin
1312 West Johnson Street
Madison 53715

3. A SELECTED LIST OF STATISTICAL DATA SOURCES

The following publications, most of them readily available in large libraries, contain many types of statistical data of use in the preparation of thematic maps and other graphic presentations. Publication titles, in most cases, suggest their contents.

Commodity Research Bureau, Inc., *Commodity Year Book* (New York: Commodity Research Bureau, Inc.), annual publication, since 1934

Dan Golenpaul (ed.), *Information Please Almanac Atlas and Yearbook* (New York: Simon and Schuster), annual publication, since 1946.

International City Managers' Association, *The Municipal Year Book* (Chicago: Cushing-Malloy, Inc.), annual publication, since 1933.

Reader's Digest Almanac and Yearbook (New York: The Reader's Digest Association, Inc.), annual publication since 1966.

The Stateman's Year-Book (New York: St. Martin's Press), annual publication, since 1864.

United Nations Educational, Scientific and Cultural Organization (UNESCO), *Statistical Yearbook* (Fortenoy, France: Imprimerie Joseph Floch), annual publication, since 1963.

United Nations Food and Agriculture Organization, *Production Yearbook* (Rome: United Nations), annual publication, since 1946.

United Nations Statistical Office, Department of Economic and Social Affairs, *Demographic Yearbook* (New York: United Nations), annual publication, since 1948.

United Nations Statistical Office, Department of Economic and Social Affairs, *Statistical Yearbook* (New York: United Nations), annual publication, since 1948.

United Nations Statistical Office, Department of Economic and Social Affairs, *World Economic Survey* (New York: United Nations), annual publication, since 1947.

United Nations Statistical Office, Department of Economic and Social Affairs, *Yearbook of International Trade Statistics* (New York: United Nations), annual publication, since 1950.

United Nations Statistical Office, Department of Economic and Social Affairs, *Yearbook of National Accounts Statistics* (New York: United Nations), annual publication, since 1957.

United Nations World Health Organization, *Annual Epidemiological and Vital Statistics* (Geneva: United Nations), annual publication, since 1948.

United States Bureau of the Census, Department of Commerce, *County and City Data Book* (Washington, D.C.: U.S. Government Printing Office), annual publication, since 1961.

United States Bureau of the Census, Department of Commerce, *Statistical Abstract of the United States* (Washington, D.C.: U.S. Government Printing Office), annual publication since 1878.

United States Bureau of the Census, Department of Commerce, *U.S. Census of Agriculture* (Washington, D.C.: U.S. Government Printing Office), decennial and mid-decennial publication, since 1840.

United States Bureau of the Census, Department of Commerce *U.S. Census of Population* (Washington, D.C.: U.S. Government Printing Office), decennial publication, since 1790.

United States Department of Agriculture, *Agricultural Statistics* (Washington, D.C.: U.S. Government Printing Office), annual publication, since 1866.

United States Labor Statistics Bureau, *Handbook of Labor Statistics* (Washington, D.C.: U.S. Government Printing Office), irregular publication, 1950 & 1967.

The World Almanac (New York: Newspaper Enterprise Association, Inc.), annual publication, since 1868.

4. MATCHING TOPOGRAPHIC MAPS AND AERIAL PHOTOGRAPHS

When used together, maps and aerial photographs can be extremely effective teaching tools. The symbolic nature of the map contrasts sharply with the less abstract but infinitely more informative representation shown on the aerial photograph. The two are highly complementary, and are not only easy to use together, but are especially suited for use together.

Published Lists of Maps and Photographs

Several lists of matching aerial photographs and topographic maps have been published. Unfortunately, the major purpose of all of these listings has been to illustrate landform features. Cultural features, generally of more interest in geographic studies, are not well covered by these lists. Among existing published lists are these:

A Set of One Hundred Topographic Maps Illustrating Specified Physiographic Features, U.S. Geological Survey, 1955.

Key to Aerial Photoindexes of Areas Covered by the Set of One Hundred Topographic Maps Illustrating Specified Physiographic Features, U.S. Geological Survey, 1963.

> This set of Geological Survey topographic sheets covers most of the 86 sections or subdivisions on their map of Physical Divisions of the United States (excluding Alaska and Hawaii). Almost all states are represented and physiographic features covered include coasts and shorelines, escarpments, alpine and continental glaciation, solution, volcanic and wind features, and other features of mountains, plains, plateaus, and valleys. Several maps in shaded relief are included in the set. An index map of the series is available from the Geological Survey (address in Section E of this chapter). The complete set of 100 maps sells for $30.00; a shorter set of 25 maps in the

series sells for $7.50. Photographic coverage is available for the majority of maps in the series and the index key to this photography, listed above, is also available on request from the Geological Survey.

A Descriptive Catalog of Selected Aerial Photographs of Geologic Features in the United States, U.S. Geological Survey, Professional Paper 590, Washington: Government Printing Office, 1968.

This catalog describes 317 sets of contact aerial photographs (1-6 prints each) that illustrate numerous types of geological features in the United States. Every state and Puerto Rico are represented by one or more sets. All are vertical aerial photographs except for one set in Hawaii and one in Alaska which are oblique. In addition to photography from the U.S. Geological Survey, photography also was provided by Agricultural Stabilization and Conservation Service, Soil Conservation Service, U.S. Air Force, U.S. Coast and Geodetic Survey, U.S. Forest Service, and U.S. Navy. The major features of each set are briefly described and information on each include exact location, scale of the photographs, and reference to topographic maps and geological reports of the area covered. An index map of the United States locates all sets. A most valuable service is provided by the inclusion of one reduced photograph from each set in the catalog to assist the prospective purchaser in his selection. Although the sets were chosen on the basis of geological interest, there are many sets that would be of great interest to both physical and cultural geography. The latter include a wide variety of agricultural and urban areas.

Gene Avery and Dennis Richter, "An Airphoto Index to Physical and Cultural Features in Eastern United States," Photogrammetric Engineering, Vol. XXXI, No. 5 (September, 1965), pp. 896-914.

A. I. Salome, "Discussion Paper on 'An Airphoto Index to Physical and Cultural Features in Eastern United States'," Photogrammetric Engineering, Vol. XXXIX, No. 6 (November, 1966), pp. 920, 930.

This is an index to Department of Agriculture vertical aerial photographs and corresponding U.S. Geological Survey topographic maps of 249 selected features in Wisconsin, Iowa, Missouri, Arkansas, Louisiana, and states to their east. Some of the topographic maps cited in the original list were in error and were corrected by the Discussion Paper cited above. The authors state: "Characteristic examples of principal physiographic regions were given first priority in the selected listing. An effort was also made to find aerial photographs depicting unusual land use patterns or unique physical features. . . . A few items of non-physiographic nature (strip mines, quarries, canals, dams, etc.) were included, because these features comprise a integral part of the landscape in which they appear." Photographs are identified by county and state, symbol and roll numbers, and date. A most useful index map is included.

Dennis M. Richter, "An Airphoto Index to Physical and Cultural Features in Western United States," Photogrammetric Engineering, Vol. XXXIII, No. 12, (December, 1967), pp. 1402-1919.

Similar in scope and purpose to the eastern states index listed above, this is an index to Department of Agriculture vertical aerial photographs and corresponding U.S. Geological Survey topographic maps in states west of those listed above. Western states covered include Hawaii but not Alaska; Arkansas and Louisiana are included in both indexes. Some 254 selected features are indexed and the author states that these". . . provide representative coverage of physiographic, cultural, vegetative, and land use features within the Western United States." Photographs and topographic maps for all features are carefully indicated by names and numbers, exact locations, and dates, and the article includes an index map.

Relph W.Kiefer, "Landform Features in the United States," Photogrammetric Engineering, Vol. XXXIII, No. 2 (February, 1967), pp. 174-182.

This index deals only with ". . . examples of geologic landforms, especially those of engineering significance." Examples from 56 sites in 36 counties in eastern, mid-western, and north central United States are included. The listing includes a brief description of the landforms, location, number, and date of aerial photographs, and names of corresponding topographic sheets. There is no index map, however.

Representative Air Photos of Canada Showing Physical Features Available from National Air Photo Library, Department of Geography, Brock University, 1968.

> This list, compiled by the Topographic Survey of the Government of Canada, includes 353 localities which illustrate a wide variety of physical features, and to a much lesser extent, cultural features. Aerial photographs available from the National Air Photo Library (Canada) are clearly identified by number and the numbers and names of topographic sheets on which the areas are located are given. Cultural features indexed by maps and aerial photographs include logging, strip farming, and peat mining in Quebec, dredging operations in the Yukon, orchards in Nova Scotia, grain farming in Saskatchewan, and electric power developments in Ontario and Manitoba.

In addition to these indexes, all stereograms issued by the Committee on Aerial Photography, University of Illinois (see Section 8 of this booklet) contain names of the Geological Survey topographic maps on which they will be found. Ninety-two of these University of Illinois stereograms are printed in the book, *Aerial Stereo Photographs* by Harold R. Wanless (see Section 1 of this booklet) and map references are given for each stereogram.

An Index to Selected Cultural and Physical Features in the United States

The following index to vertical aerial photographs and the topographic maps upon which they will be found has been compiled from original sources as well as from the articles in *Photogrammetric Engineering* listed above and photography of the Committee on Aerial Photography, University of Illinois. It is a short list and makes no pretense of extensive or exhaustive coverage. While a few physical features, chosen for their dramatic quality, are included, the list focuses on cultural features and uses aerial photography and topographic maps believed to be of potential value in high school geography instruction. The accompanying index map of North America locates each site described.

All photography listed is vertical aerial photography. All are black-and-white photographic prints except index numbers 1, 14 and 18 which are full color photographic prints. For details on how to secure this photography, see Section 8 of this booklet; for details on how to secure the topographic maps, see Section 5.

For each site, a brief description of major features on the aerial photography is given. This is followed by identification of the photography by government agency, county (for Department of Agriculture photography only), and exposure numbers (or stereogram number in case of University of Illinois photography), fractional scale, and date. The three exposure numbers given constitute a stereotriplicate; all University of Illinois single stereograms are either stereopairs or stereotriplicates. The appropriate U.S. Geological Survey topographic map(s) upon which the area of the photography will be found is (are) identified by sheet names, fractional scale, and date of publication.

Under the site description, wherever appropriate, reference is made to plates in F. J. Marschner, Land Use and Its Patterns in the United States, Agricultural Handbook No. 153, Washington: Department of Agriculture, 1959. In such cases, the photography given in this list is identical to or similar to photography used in this reference. The Marschner book may be referred to for additional discussion of the area, its topography, soils, climate, agriculture, human resources, and other factors.

Index No.		Aerial Photography				Topographic Maps		
		Agency **	County & Exposure Numbers	Scale	Date	Sheet Name	Scale	Date
1	ALASKA: Augustine Island. Active cindercone 4,025 feet above waters of Lower Cook Inlet; volcanic smoke pours from the cone.	C&GS	66-M(C)-227, 228, 229 (color)	1:60,000	1966	Iliamna B-2	1:63,360	1958
2	CALIFORNIA: Corona Valley, Citrus and nut growing at foot of Santa Ana Mtns., Southern California. (Ref. Marschner, Plate 106)	ASCS	Riverside Co., AXM-4F-111, 112, 113	1:20,000	1949	Corona South	1:24,000	1954
3	CALIFORNIA: San Andreas Rift, Los Angeles County. Part of longest rift zone in U.S.; mountains, reservoirs and lakes; orchards and dry farming near edge of Mohave Desert.	USGS	Illinois Stereogram 185	1:86,700	1954	Bouquet Res.	1:62,500	1958
4	FLORIDA: Lake District. Citrus groves in rolling Karst lake topography near Winter Haven, central Florida. (Ref. Marschner, Plate 154)	ASCS	Polk Co. CTU-7H-194, 195, 196	1:20,000	1952	Eloise	1:24,000	1955
5	INDIANA: Knobstone Escarpment. Contrasts in rural landuse and land division in glaciated and non-glaciated topography just north of New Albany, southern Indiana. (Ref. Marschner, Plate 43)	ASCS	Floyd Co. RJ-2AA-107,108, 109	1:20,000	1960	New Albany	1:24,000	1960

6	ILLINOIS: Golconda. Ohio River town, lock and dam, flood wall, fairgrounds; floodplain of both Illinois and Kentucky.	ASCS	Illinois Stereo gram 103	1:21,000	1952	Golconda	1:62,500	1959
7	KANSAS: Goodland. Wheat farming on High Plains of western Kansas; strip cropping, combining in operation; entire market town-county seat with residential and commercial areas; grain elevators along railroad.	ASCS	Sherman Co. AZG-2P-194, 195, 196	1:21,000	1955	Goodland	1:24,000	1966
8	LOUISIANA: Mississippi Delta. French-settled long lot system; homes and roads along levees. (Ref. Marschner, Plate 137)	ASCS	Assumption Co. CEF-5T-198,199, 200	1:20,000	1957	Napoleonville	1:62,500	1952
9	MASSACHUSETTS: Marblehead. Town on peninsula and large tombolo; offshore islands; thousands of small boats in Massachusetts Bay.	ASCS	Essex Co. DPP-9K-91, 92, 93	1:20,000	1952	Marblehead S. and N. (2 maps)	1:24,000	1956
10	MICHIGAN: Detroit. Belle Isle in Detroit R.; commercial, industrial, and slum housing of midtown Detroit.	ASCS	Wayne Co. XU-1P-33, 34, 35	1:20,000	1957	Detroit & Vicinity S.	1:24,000	1952
11	MISSISSIPPI: Moss Point. Large pulp and paper mill, pecan groves, and town on Gulf Coastal Plain.	ASCS	Illinois Stereogram 305	1:20,100	1958	Pascagoula & Grand Bay	1:62,500 1:62,500	1955 1958

12	NEW MEXICO: Upper Rio Grande River Valley. Irrigated bottomlands and dry uplands bordering Rio Grande; area originally divided by Spanish land grants; near Alameda, north of Albuquerque. (Ref. Marschner, Plate 110)	ASCS	Sandoval Co. DFD-2DD-119, 120, 121	1:20,000	1963	Alameda	1:24,000	1960
13	NEW YORK: Haverstraw, on the Hudson River. Palisades of the Hudson, tidal marshes; residential, commercial, and industrial areas.	USGS	Illinois Stereogram 315	1:20,300	1953	Haverstraw	1:24,000	1955
14	NEW YORK: New York City. Southern tip of Manhattan showing piers & ocean liners along Hudson R.; canyons of Wall St. and other streets adjacent to Battery Park.	C&GS	66-L(C)-7552, 7553, 7554 (color)	1:5,000	1966	Jersey City	1:24,000	1955
15	NEW YORK: Niagara Falls. Falls and gorge in both United States & Canada; commercial and industrial areas in both countries; power facilities.	ASCS	Niagara Co. ARE-1V-12, 13, 14	1:20,000	1958	Niagara Falls	1:24,000	1948
16	PENNSYLVANIA: Lancaster Co. Intensively used farmland in Penna. Dutch country; strip-cropping produces grotesque land use patterns. (Ref. Marschner, Plate 18)	ASCS	Lancaster Co. AHG-5EE-24, 25, 26	1:20,000	1964	Wakefield	1:24,000	1955

17	VIRGIN ISLANDS: St. Thomas. Charlotte Amalie town and harbor; rugged interior core of island; Magens Bay on north coast; water catchments particularly prominent.	USGS	GS-YM-171, 172, 173	1:28,400	1954	Central St. Thomas	1:24,000	1955
18	WASHINGTON: Seattle. Duwamish Waterway and lumber mills; residential and other industrial areas.	C&GS	66-L(C)-3189A, 3190A, 3191A, (color)	1:15,000	1966	Seattle south	1:24,000	1949
19	WISCONSIN: Superior. Iron-ore loading docks on Lake Superior; other transportation and commercial features.	ASCS	Douglas Co. BRS-4V-73, 74, 75	1:20,000	1958	Duluth, Superior, & Vicinity	1:24,000	1954
20	WYOMING: Yellowstone National Park. Upper Geyser Basin with Old Faithful and other geysers, lodges, stores, and campground.	USGS	Illinois Stereogram 526	1:18,700	1954	Old Faithful or Yellowstone Park	1:62,500 1:125,000	1956 1961

** ASCS = Agricultural Stabilization and Commodity Service (or predecessor agencies), Dept. of Agriculture
C&GS = Coast and Geodetic Survey, Dept. of Commerce
USGS = U.S. Geological Survey, Dept. of Commerce

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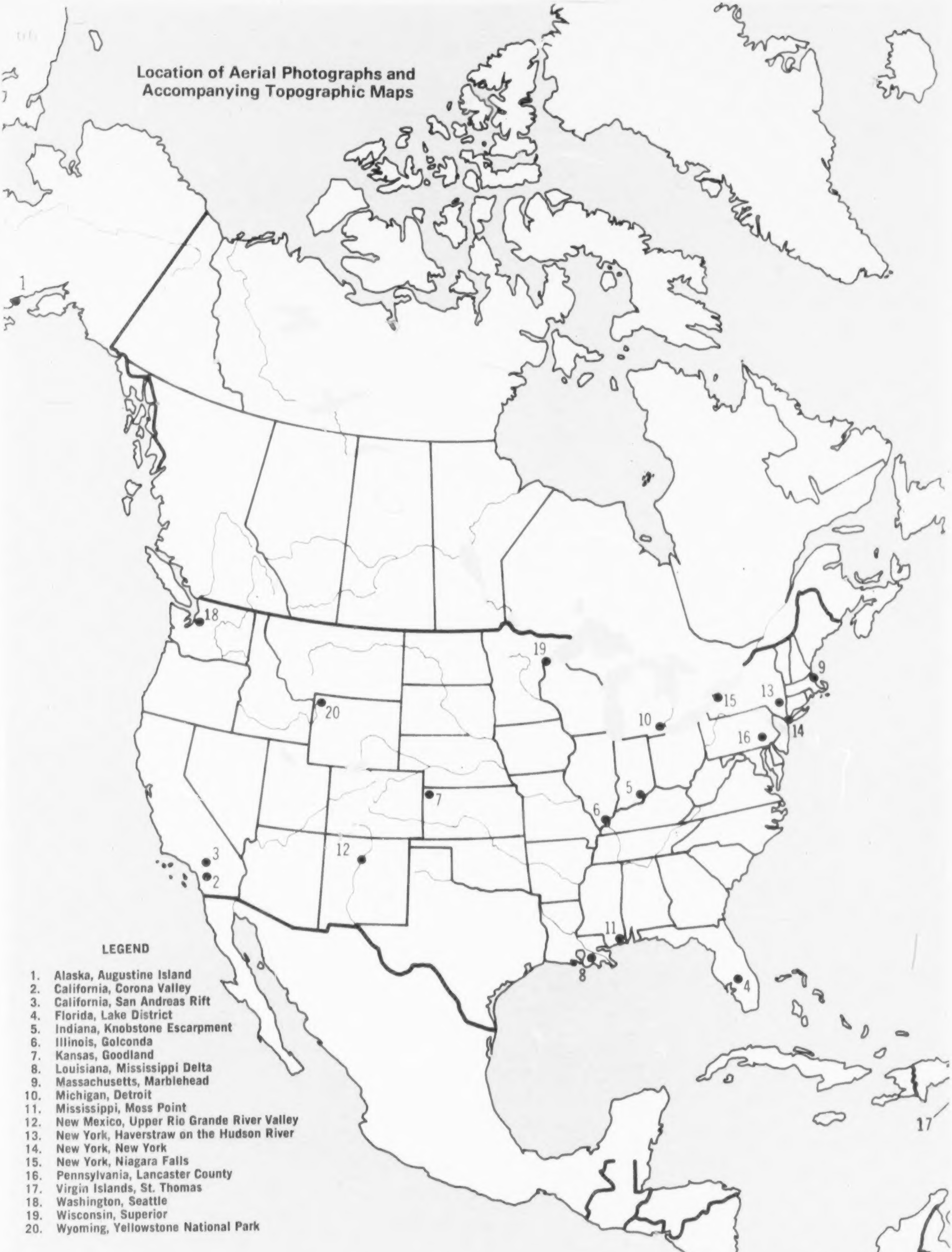
Location of Aerial Photographs and Accompanying Topographic Maps



LEGEND

1. Alaska, Augustine Island
2. California, Corona Valley
3. California, San Andreas Rift
4. Florida, Lake District
5. Indiana, Knobstone Escarpment
6. Illinois, Golconda
7. Kansas, Goodland
8. Louisiana, Mississippi Delta
9. Massachusetts, Marblehead
10. Michigan, Detroit
11. Mississippi, Moss Point
12. New Mexico, Upper Rio Grande River Valley
13. New York, Haverstraw on the Hudson River
14. New York, New York
15. New York, Niagara Falls
16. Pennsylvania, Lancaster County
17. Virgin Islands, St. Thomas
18. Washington, Seattle
19. Wisconsin, Superior
20. Wyoming, Yellowstone National Park

5. SHEET MAPS AND OTHER CARTOGRAPHIC MATERIALS FROM GOVERNMENT AND SOCIETY SOURCES

Each year thousands of new maps and related cartographic materials are issued by many federal, state, and local government agencies in the United States and abroad. Geographical societies also issue maps. Many of these materials are readily available for purchase, usually at very reasonable prices; some are free. A survey of these agencies and societies and their map products would be of potential use for high school geography instruction.

Federal Government Maps

Numerous agencies of the Federal government are the major producers of original maps in the United States. A general guide to the more productive of these agencies and their products is presented below. This guide samples their products but does not pretend to list them all. Prices and products change and the information given here should not be used to order cartographic materials. All agencies issue listings or catalogues and/or indexes of their products. Write for these first before ordering. And, when ordering, follow instructions carefully to avoid rejection of your order. Note that many federal agencies require prepayment of orders.

Information on the availability of all published maps of the U.S. Federal Government may be directed to:

Map Information Office
U.S. Geological Survey
Washington, D.C. 20242

This agency acts as a central clearing house for maps and aerial photography information on the United States. Maps available free on request include these:

(1) *Status of Topographic Mapping in the United States*
(2) *Status of Geologic Mapping in the United States*
(3) *Index to National Topographic Maps of the U.S.*, 1:250,000
(4) *Index to Topographic Maps of the U.S.*, 1:1,000,000
(5) Index to topographic maps of each of the 50 states, and Puerto Rico and the Virgin Islands. These are separate maps which show the areas covered by topographic and other maps and give prices and instructions for ordering.

The Map Information Office has a variety of leaflets available, some of which are of considerable potential value to the geography teacher. Among the more useful free leaflets and booklets are these:

Topographic Maps, 20 pp. Discusses the contents of a topographic map and how it is compiled; includes scales, series, control surveys, symbols, and map revision.

Topographic Maps: Silent Guides for Outdoorsmen, 8 pp. Includes directions on map mounting and preservation.

Types of Maps Published by Government Agencies

Geographic Centers of the United States

The National Atlas Project

Geologic Maps of the Moon

Maps of the United States, M10-1

Metropolitan Area Topographic Maps, M10-2

State Maps, M10-3

Shaded Relief Maps, M10-4

Topographic Maps of National Parks, Monuments, and Historic Sites, M10-5

Individual maps may be purchased from the U.S. Geological Survey and from other Federal government agencies in Washington and elsewhere.

Before discussing major Federal government map producing agencies, mention should be made of three agencies which do not produce maps but which do sell maps and related cartographic materials.

The first of these three specialized agencies is:

Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

The Superintendent of Documents sells maps of federal government mapping organizations that issue relatively small numbers of maps. These include maps of the Bureau of the Census, the Weather Bureau, Soil Conservation Service, Federal Power Commission, Post Office Department, and Bureau of Indian Affairs. It also handles many maps published jointly by two or more agencies. The latter type includes, as an example, a colorful 42" x 64" wall map, 1:3,168,000, of the United States showing federal lands and historical monuments, compiled by the Geological Survey and the Bureau of Land Management in 1964 (Cat. I53.11: Un 3/964, $2.00 a copy). Other specific maps of interest sold by the Superintendent of Documents include:

Domestic Air Mail Transportation System of the United States, 1962, 34" x 55", P 1.39: A.7, $.50

Federal Aid Highways Map, 1965, 42" x 65", C 37.13: In 8/965, x $1.50

Indian Land Areas of the United States, 1965, 26" x 36", In 20.47: In 2/2, $.30

Major Natural Gas Pipelines, 1967, 13" x 19", FP 1.13: G21/2/966-2, $.20

National Park System, Eastern United States, 23" x 29", I29.8: Ar 3e/962, $.20

National Park System, Western United States, 23" x 29", I29.8: Ar 3w/962, $.20

Principal Electric Facilities in the United States, 1966, FP 1.13: Un 35/966, $1.25

Public Land Surveys and Public Lands in the United States, 1966, 1:2,500,000, 2 sheets, each 42" x 52", I53.11: Un 3/2/965/sh 1-2, $3.00 per sheet

Selected Civil War Maps (reproduced from originals), each 24" x 30", C 4.9/2:C49/3, set of 20 maps for $5.00

The Superintendent of Documents also handles gazetteers and other publications of the United States Board on Geographic Names and a variety of publications on cartography and aerial photography. The agency publishes a free booklet listing maps, charts and related material for sale--Price List #53 (Maps, Engineering, Surveying).

The second specialized agency is:

Geography and Map Division
The Library of Congress
Washington, D.C. 20540

The Geography and Map Division, with more than 3,000,000 maps, 28,000 atlases, and a variety of other cartographic materials (globes, relief models, gazetteers, cartographic journals, etc.), has custody of what is probably the world's largest cartographic library. Its collection grows enormously each year: thus, in the fiscal year 1967, 200,000 maps and 2,800 atlases were added to its holdings.

Reference service is available to the public in the Geography and Map Reading Room and by telephone or through correspondence. The collections of the Division are for reference use only, and maps and atlases are not available for sale or free distribution. Reference materials may be freely consulted in the Geography and Map Reading Room, but loans are made only to members of Congress, Federal agencies, and authorized libraries. Reproductions of maps (and plates of atlases), however, may be ordered through the Library's Photoduplication Service, subject to copyright or other restrictions. The Division must refuse correspondence requests that can be answered by a library in the inquirer's locality. Nor is it possible for the Division to undertake extensive research projects, or to assist students in preparing bibliographies, term papers, or other academic assignments.

Although the Geography and Map Division publishes no original maps, they do publish map bibliographies, some map reproductions, and various finding aids. A complete list of their publications is available upon request; some are free.

Among current, in-print, Library of Congress publications are these:

A Guide to Historical Cartography, 1962, 22 pp., $.35

Aviation Cartography, 1960, 245 pp., $1.75

John Smith Map of Virginia, 1612 (facsimile), with *descriptive text, 1957, 16" x 19"*, $1.75

Selected Maps and Charts of Antarctica, 1959, 193 pp. $1.50

United States Atlases, in two volumes, 1950 and 1953, *445 pp. and 301 pp.*, $2.50 each

All of these publications are for sale by:

Card Division
Library of Congress
Navy Yard Annex, Bldg. 159
Washington, D.C. 20541

Other publications of the Geography and Map Division include these:

Civil War Maps, 1961, 138 pp., $1.00

A Descriptive List of Treasure Maps and Charts in the Map Collections of the Library of Congress, 1964, 29 pp., $.30

Maps Showing Explorers' Routes, Trails, and Early Roads in the United States; an Annotated List of Maps in the Map Collections of the Library of Congress, 1962, 137 pp., $1.25

Three-Dimensional Maps, 1964, 38 pp., $.35

Land Ownership Maps, 1967, 86 pp., $.70

All of this second group of publications is for sale by the Superintendent of Documents, Government Printing Office.

The third of these specialized agencies is:

Publications and Sales Branch
The National Archives and Records Service
General Services Administration
Washington, D.C. 20408

The National Archives are the official repository for maps, aerial photographs, and much related material included in the permanently valuable noncurrent records of the federal government. They are responsible for preserving these records and making them available for use by federal officials, scholars, and the general public. These holdings include over 1,600,000 maps which range from the latest published topographic sheets to unique manuscript items from the early nineteenth century, many of which have never been published.

Researchers may examine map materials personally in the Cartographic Branch of the National Archives and information about them can be furnished by correspondence. Photoreproductions of maps are made on order and a number of *Special Lists and Preliminary Inventories* have been published. Samples of these include:

List of Cartographic Records of the Bureau of Indian Affairs, 1954, Special List No. 13, 127 pp.

Cartographic Records of the Bureau of the Census, 1958, Preliminary Inventory No. 103, 108 pp.

List of Cartographic Records of the General Land Office, 1964, Special List No. 19, 202 pp.

Civil War Maps in the National Archives, 1964, Publication 64-12, 127 pp.

Cartographic Records of the Forest Service, 1967, Preliminary Inventory No. 167, 71 pp.

A complete list of publications and their prices is available upon request. A comprehensive guide to all cartographic holdings in the National Archives is expected to be published in 1969.

The types of maps, charts, and related materials (and how to obtain them) of eleven major federal government agencies are described below.

AERONAUTICAL CHART AND INFORMATION CENTER (ACIC), U.S. AIR FORCE

More than 30 types and series of aeronautical and related charts and maps, mainly of foreign areas, are produced by this agency. Most ACIC charts available to the general public are distributed through the Coast and Geodetic Survey; some are sold through the Superintendent of Documents.

Among those sold by the Coast and Geodetic Survey which are of potential interest in geography are these:

Pilotage Charts, 1:500,000; small size, 101 sheets, $.25 each; large size, 139 sheets, $.50 each

World Aeronautical Charts and Operational Navigation Charts, 1:1,000,000; small size, 217 sheets, $.25 each; large size, 182 sheets, $.50 each

Jet Navigation Charts, 1:2,000,000, 51 sheets, $.50 each

Global Navigation and Planning Charts, 1:5,000,000, 26 sheets, $.50 each

Equidistant Chart of the World Centered on the United States, 1:47,423,730, $.25

Geography Charts. This series of 24 maps was designed for use at the Air University but are well suited to high school instructional work. Each shows the world (excluding Antaractica) on a North Polar-centered Stereographic Projection. Among the most useful are these:

GH-1a	Political and Time Chart, rev. ed. 1965
GH-2a	Physical and Political Chart, rev. ed. 1965
GH-3a	Temperature Provinces and Ocean Current Chart, rev. ed. 1965
GH-4a	Precipitation Chart, rev. ed. 1965
GH-5a	Climate Chart, rev. ed. 1965
GH-6a	Vegetation Chart, rev. ed. 1965
GH-7a	Density of Population Chart, 1960
GH-8a	Economic Chart, 1960
GH-9a	Transportation Chart, 1960

All these are available in two sizes: 1:50,000,000, 24 3/4" X 20 3/4", $.25 each; 1:25,000,000, 49 1/2" X 51 5/8", $.50 each. The large size charts are suitable for use as wall maps. Other maps in this same series treat isobars and prevailing winds, generalized world air movement, and climatic zones on a month-by-month basis.

Complete information and indexes on these and many other ACIC maps may be secured from:

Distribution Division, C-44
Coast and Geodetic Survey
Rockville, Maryland 20852

ACIC charts distributed by the Superintendent of Documents (address given previously) include these:

Ranger VII Charts of the Moon, 5 sheets, $1.75 per set
Ranger VIII Charts of the Moon, 7 sheets, $2.50 per set
Ranger IX Charts of the Moon, 5 sheets, $1.75 per set

Lunar Astronautical Charts, 1:1,000,000; 31 issued, others to come, $.35 each

Lunar Farside Charts (made from orbiter photography), two sheets, 1:5,000,000 and 1:10,000,000, $.50 and $.35 each, respectively

Chart of the Planet Mars, $.35

While ACIC is not prepared to serve requests from the public for copies of their charts and other publications, general information on their mapping work and professional employment opportunities may be secured from:

Aeronautical Chart and Information Center
Second and Arsenal
St. Louis, Missouri 63118

ARMY MAP SERVICE (AMS), CORPS OF ENGINEERS, Department of the Army

This agency produces a wide variety of topographic maps and other kinds of military maps of foreign areas and maps of strategic areas in the United States. A description of the history and operations of the Army Map Service entitled The Army Map Service, Mapping, Geodesy (Stock No. 202904) is available without charge from:

Army Map Service
Corps of Engineers, U.S. Army
Washington, D.C. 20315

Some AMS sheets of foreign areas are available for sale to the general public. Included are these:

Area	Scale	Series No.	Number of Sheets	Price Per Sheet
Africa	1:2,000,000	2201	37	$ 1.00
Europe	1:2,000,000	6203	9	1.00
Melanesia	1:500,000	X401	17	.50
East Africa	1:500,000	X401	130	.75
World	1:1,000,000	1301	632	1.00
Asia (plastic relief models)	1:1,000,000	1301P	151	4.00

Maps cited above and others are listed in the latest *Listing of Army Map Service Map Series on Public Sale*. Indexes for each map series are available at $.05 each. Listing, indexes, and maps are ordered from:

Commanding Officer
Army Map Service
ATTN: 16230
Washington, D.C. 20315

Other AMS sheet maps available include

Railroad Map of United States	1:2,500,000	8204	4	$ .60 (complete set)

(These four sheets may be fitted together to form a 7' X 7', 4" wall map.)

Conterminous United States (plastic relief models)	1:250,000	V501P-V502P	220	4.00
Hawaiian Islands (plastic relief models)	1:250,000	W523P	5	4.00

Alaska (plastic relief models)	1:250,000	Q501P	42	$ 4.00
Puerto Rico (plastic relief models)	1:250,000	E502P	2	4.00

This second group of AMS map and plastic relief models may be ordered from:

Commanding Officer
Army Map Service
San Antonio Field Office
Building 4011
Fort Sam Houston, Texas 78234

BUREAU OF THE CENSUS, U.S. Department of Commerce

May maps and graphs of page size or less have been published in the various censuses. Recent censuses which contain significant groups of statistical and outline maps include:

1959 Census of Agriculture

1960 Census of Population

1960 Census of Housing

1960 Census of Population and Housing

1963 Census of Manufactures

1963 Census of Mineral Industries

1963 Census of Business

Census publications are sold by the Superintendent of Documents. The *1959 Census of Agriculture* contained many statistical maps of the United States. Information on ordering individual prints of any of these maps may be obtained from:

Agricultural Division
Bureau of the Census
Washington, D.C. 20233

The Bureau has published a number of separate sheet maps of the United States, many of them based upon census materials. Included are:

U.S. County Outline Map, 1960, 1:5,000,000 26" X 41", $.50

State Minor Civil Division or Census County Division Maps, 1960, maps of each state on a separate sheet, scales vary, each 36" X 48", $.35 each

United States Maps, Series GE50, 1:5,000,000, each 30" X 42", $.50 each
(This is a significant and extremely useful series of colored thematic maps which belongs in every high school geography classroom.)

Series maps issued:

No. 1 - Population Distribution, Urban and Rural, in the United States: 1960
No. 2 - Standard Metropolitan Statsitical Areas of the United States and Puerto Rico: 1963
No. 3 - Congressional Districts for the 89th Congress (1965-66)
No. 4 - Housing Built Before and After 1950 in Standard Metropolitan Statistical Areas of the United States: 1960
No. 5 - Housing Owned and Rented in Standard Metropolitan Statistical Areas of the United States: 1960
No. 6 - Families with Incomes under $3,000 in 1959, by Counties of the United States: 1960
No. 7 - Older Americans in the United States, by Counties: 1960
No. 8 - Per Capita Money Income for 1959, by Counties of the United States
No. 9 - Population with High School Education or More by Counties of the United States: 1960
No.10 - Youths of 16 and 17 Years of Age in School, by Counties of the United States: 1960
No.11 - Congressional Districts for the 90th Congress (1967-1968)
No.12 - Employment in Manufacturing, by Counties of the United States: 1960
No.13 - Employment in Professional, Technical, and Kindred Occupations, by Counties of the United States: 1960
No.14 - American Indians in the United States: 1960
No.15 - Japanese and Chinese in the United States: 1960
No.16 - Negro Population as Percent of Total Population, by Counties of the United States: 1960
No.17 - Standard Metropolitan Statistical Areas in the United States and Puerto Rico: 1967

No.18 - Retail Trade in the United States: 1963
No.19 - Sales of Retail Shopping Goods Stores for Selected Standard Metropolitan Statistical Areas in the United States: 1963
No.20 - Wholesale Trade in the United States: 1963
No.21 - Hotel-Motel Receipts in the United States: 1963
No.22 - Manufacturing in the United States: 1963
No.23 - Mineral Industries in the United States: 1963

General inquires on mapping and other activities of this agency should be addressed to:

Bureau of the Census
U.S. Department of Commerce
Washington, D.C. 20233

Maps and other publications of the Bureau may be ordered by mail from the Superintendent of Documents (address given previously) or from any U.S. Department of Commerce Field Office. Locations of these field offices are:

ALABAMA

908 South 20th. Street
Birmingham, Ala., 35205

ALASKA

306 Loussac-Sogn Bldg.
Anchorage, Alaska 99501

ARIZONA

230 N. First Avenue
Phoenix, Ariz. 85025

CALIFORNIA

1031 S. Broadway
Los Angeles, Calif. 90015

450 Golden Gate Avenue
San Francisco, Calif. 94102

COLORADO

20th. and Stout Streets
Denver, Colo. 80202

CONNECTICUT

18 Asylum Street
Hartford,Conn. 06103

FLORIDA

400 West Bay Street
Jacksonville, Fla. 32202

25 W. Flagler Street
Miami, Fla. 33130

GEORGIA

75 Forsyth Street N.W.
Atlanta, Ga. 30303

125-29 Bull Street
Savannah, Ga. 31402

HAWAII

1015 Bishop Street
Honolulu, Hawaii 96813

ILLINOIS

219 S. Dearborn Street
Chicago, Ill. 60604

IOWA

210 Walnut Street
Des Moines, Iowa 50309

LOUISIANA

610 South Street
New Orleans, La. 70130

MARYLAND

U.S. Customhouse
Gay & Lombard Streets
Baltimore, Md. 21202

MASSACHUSETTS

John F. Kennedy Federal Building
Boston, Mass. 02203

MICHIGAN

Federal Building
Detroit, Mich. 48226

MINNESOTA

110 South Fourth Street
Minneapolis, Minn. 55401

MISSOURI

911 Walnut Street
Kansas City, Mo. 64106

1520 Market Street
St. Louis, Mo. 63103

NEVADA

300 Booth Street
Reno, Nev. 89502

NEW MEXICO

U.S. Courthouse
Albuquerque, N. Mex. 87101

NEW YORK

117 Ellicott Street
Buffalo, N.Y. 14203

350 Fifth Avenue
New York, N.Y. 10001

NORTH CAROLINA

Federal Building
Greensboro, N.C. 27402

OHIO

550 Main Street
Cincinnati, Ohio 45202

666 Euclid Avenue
Cleveland, Ohio 44114

OREGON

520 S. W. Morrison Street
Portland, Oreg. 97204

PENNSYLVANIA

1015 Chestnut Street
Philadelphia, Pa. 19107

1000 Liberty Avenue
Pittsburgh, Pa. 15222

PUERTO RICO

Post Office Building
San Juan, Puerto Rico 00902

SOUTH CAROLINA

334 Meeting Street
Charleston, S.C. 29403

TENNESSEE

147 Jefferson Avenue
Memphis, Tenn. 38103

TEXAS

1114 Commerce Street
Dallas, Tex. 75202

515 Rusk Avenue
Houston, Tex. 77002

UTAH

125 South State Street
Salt Lake City, Utah 84111

VIRGINIA

400 North 8th Street
Richmond, Va. 23240

WASHINGTON

909 First Avenue
Seattle, Wash. 98104

WEST VIRGINIA

500 Quarrier Street
Charleston, W. Va. 25301

WISCONSIN

238 W. Wisconsin Avenue
Milwaukee, Wis. 53203

WYOMING

2120 Capitol Avenue
Cheyenne, Wyo. 82001

COAST AND GEODETIC SURVEY (C&GS), U.S. Department of Commerce

Among maps and charts produced by this agency are these:

> Nautical charts of the coasts and harbors of the United States and its possessions. These include *Harbor Charts* (1:50,000 are larger); *Coast Charts* (1:51,000---1:100,000); *General Charts* (1:100,000--1:600,000); *Intracoastal Waterway/Small Craft Charts* (1:40,000). Nautical charts are priced at $1.00, 1.50, and 2.00 each.
>
> Aeronautical charts of the United States. These include *Local Charts* (1:100,000), *Sectional Charts* (1:500,000), *World Aeronautical Charts* (1:1,000,000), *Jet Navigation Charts* (1:2,000,000), and *Enroute Low and High Altitude Charts*. Aeronautical charts are priced at $.35, .40, and .50 each.
>
> Miscellaneous map products including United States and world outline maps, map projections, isomagnetic charts and tidal current charts, priced $.05--1.00 each.

Although nautical charts are of limited value in geographic work, aeronautical charts can be of very considerable utility. General information on maps and other publications of the C&GS may be obtained from:

Coast and Geodetic Survey
Environmental Science Services Administration
U.S. Department of Commerce
Rockville, Maryland 20852

Included are these free materials which may be requested for educational purposes:

Earliest Maps of Washington, D.C. (booklet with map reproductions)

Map Projections for Modern Charting (leaflet)

Ocean Currents of the World (map)

Nautical Chart Catalogue

Aeronautical Chart Catalogue

Nautical Chart (sample copy)

General information on C&GS charts and other publications may be secured also from these regional offices of the Survey:

10th Floor
Customhouse
Boston, Massachusetts 02109

439 West York Street
Norfolk, Virginia 23510

315 Customhouse
423 Canal Street
New Orleans, Louisiana 70139

324 U.S. Courthouse
811 Grand Avenue
Kansas City, Missouri 64106

Room 230B, Federal Building
300 N. Los Angeles Street
Los Angeles, California 90012

405 Customhouse
Portland, Oregon 97209

1801 Fairview Avenue, East
Seattle, Washington 98102

Room 302
632 Sixth Avenue
Anchorage, Alaska 99501

P. O. Box 3887
Honolulu, Hawaii 96812

Charts of the C&GS may be purchased by mail or over-the-counter from numerous commercial dealers. Mail and over-the-counter sales from the Survey:

Washington, D.C.--Mail Orders:

Distribution Division
Coast & Geodetic Survey
Environmental Science Services Administration
Rockville, Maryland 20852

Counter Sales:
Room 1125
Commerce Building
15th and Constitution N.W.
Washington, D.C. 20235

New York---------Environmental Science Services Administration
Coast & Geodetic Survey
Room 1407
Federal Office Building
90 Church Street
New York, N.Y. 10007

San Francisco----Environmental Science Services Administration
Coast & Geodetic Survey
Room 121, Customhouse
555 Battery Street
San Francisco, California 94111

The Coast and Geodetic Survey, Its Products and Services, 1966, 80 pp., publication 10-2, is a well illustrated reference book to the mapping and other programs of the C&GS. It is available from the Superintendent of Documents at $1.00 a copy.

Aeronautical charts of foreign areas produced by Aeronautical Chart and Information Center (U.S. Air Force) are sold to civilian users by the C&GS. The Aeronautical Chart Catalogue mentioned above lists ACIC charts available and they may be purchased ($.25--.50 each) from the Distribution Division in Rockville, Maryland.

Commercial dealers of C&GS aeronautical charts are located throughout the United States and are most often aircraft sales or flying service companies at airports. A complete list of almost 900 authorized aeronautical chart agents is available from the Survey. Commercial dealers of nautical charts are mainly found in coastal cities and include sporting goods stores, marinas, marine supply houses, and boat sales firms. A complete list of over 625 authorized nautical chart agents is available from the Survey also. A few of the commercial map agents listed in the next section of this booklet handle C&GS aeronautical and/or nautical charts, and those that do are marked specifically.

CORPS OF ENGINEERS DISTRICTS, U.S. Army

Specific engineer divisions and districts, as listed below, issue various types of navigation and other charts and maps for inland waterways. Many kinds of maps of water resources development for projects under their jurisdiction are available also.

U.S. LAKES SURVEY issues nautical charts of various types and scales for all of the Great Lakes and connecting waterways including the St. Lawrence River, Lake Champlain, N.Y. State Barge Canal System, Lake St. Clair, St. Mary's River, and the Minnesota-Ontario border lakes. Prices of charts vary from $.65--2.00; most are priced at $1.00 each. A free catalogue is available as is an illustrated brochure, 24 pp., titled The U.S. Lake Survey Story. Mail requests for catalogue, map sales, and other information should be addressed to:

Lakes Survey District
Corps of Engineers
630 Federal Building
Detroit, Michigan 48226

Over-the-counter sales of Lakes Survey charts are handled at their Detroit office (Room 635) and at Corps of Engineers offices in Sault Ste. Marie, Michigan; Buffalo, New York; Cleveland, Ohio; Chicago, Illinois; and Massena, New York.

OHIO RIVER DIVISION, Corps of Engineers, issues navigation charts and other maps of the Ohio River and its navigable tributaries. The latter include the Allegheny, Monongahela, Kanawha, Cumberland, Kentucky, Green, Tennessee, Wabash, and others. Scales and prices vary. Requests for charts, listings, price list, and other publications may be addressed to:

U.S. Army Engineers Division, Ohio River
Corps of Engineers
10th Floor, Federal Office Building
550 Main Street
P.O. Box 1159
Cincinnati, Ohio 45201

These charts are sold at the Cincinnati office and by district engineer offices in Pittsburgh, Pennsylvania; Huntington, West Virginia; Louisville, Kentucky; and Nashville, Tennessee.

MISSISSIPPI RIVER COMMISSION issues navigation charts of the Lower Mississippi Basin (below Cairo, Illinois) and some topographic maps following U.S. Geological Survey standards. For further information and listing of charts and maps, address:

Lower Mississippi Valley Division
Corps of Engineers
P.O. Box 80
Vicksburg, Mississippi 39180

U.S. ARMY ENGINEERS DIVISION, CHICAGO, issues navigation charts of the upper Mississippi (above Cairo, Illinois) and its major tributaries including the Illinois Waterway to Lake Michigan. For further information, prices, and listing of charts, address:

Corps of Engineers
536 South Clark Street
Chicago, Illinois 60605

MISSOURI RIVER DIVISION, Corps of Engineers, issues navigation charts, recreation maps, and a number of topographic sheets of the Missouri River Valley. Scales vary. Individual charts and maps are priced from $.20 up; most are $.50 each. Topographic maps include 104 sheets at 1:24,000 made in 1947, and 118 sheets at 1:12,000 made in 1945-46 which show topographic and cultural features adjacent to the river banks. The 1:24,000 series uses a 5 foot contour interval in the floodplain and a 25 foot interval on the valley walls and shows all topography and culture within the alluvial valley. The 1:12,000 series uses a 2 foot contour interval and shows all topography and culture for a distance of approximately 2,500 feet inland. The price of each sheet in both series is $.50. Complete lists and sales of maps and charts of this division are available from these two offices:

Omaha District, Corps of Engineers
6012 U.S. Post Office and Court House
Omaha, Nebraska 68102

U.S. Army Engineers District
700 Federal Office Building
601 East 12th Street
Kansas City, Missouri 64106

FOREST SERVICE, U.S. Department of Agriculture

This agency issues detailed topographic, cadastral, fire protection, and sportsman's maps of national forests and wilderness areas. Scales and prices of maps vary. Free upon request are price lists and index maps of National Forest regions and other lands of continental United States administered by the Service. Address:

Forest Service
U.S. Dept. of Agriculture
Washington, D.C. 20250

GEOLOGICAL SURVEY (USGS), U.S. Department of Interior

This mapping organization is the major U.S. civilian map producer for maps of the United States and its possessions on a variety of scales and for a variety of purposes. Among the major map series of particular interest for high school geography work are these:

General topographic quadrangles of 7 1/2 minutes of latitude and longitude, most at 1:24,000, and 15 minutes of latitude and longitude, most at 1:62,500, sold at $.50 each. Approximately two-thirds of the United States is covered by maps of these scales and a considerable portion of the rest of the country is under compilation. Coverage east of the Mississippi River is excellent with the exception of parts of the southern states. Coverage west of the Mississippi is good in some areas and spotty in other areas with the exception of Missouri, Louisiana, California, and Washington, which are reasonably well covered. The best mapped states are Indiana, Ohio, Kentucky, Massachusetts, Connecticut, Rhode Island, New Jersey, Delaware, and Maryland, all of which are completely covered at the scale of 1:24,000.

Metropolitan Areas Topographic Maps, 1:24,000, most priced at $2.00 per sheet. Fifty-nine major metropolitan areas in the United States are covered on large size sheet maps. Although a single sheet covers most cities, larger cities such as New York, Chicago, and Los Angeles require two or more sheets.

1:250,000 Series, priced at $.75 each. Each map is published in a quadrangle unit of 1° of latitude by 2° of longitude and covers areas ranging from 6,400 to 8,900 square miles depending upon latitude. The conterminous United States and Hawaii are completely covered by 473 multi-color maps in this series. Alaska is covered by 153 other sheets in this series.

2

The series is extremely useful for understanding and evaluating broad patterns of much larger areas than are shown on larger scale topographic maps.

1:1,000,000 Series, priced at $1.00 each. Each map contains 4° of latitude and 6° of longitude (12° for Alaska) and covers 73,734--122,066 square miles, depending upon latitude. Some 53 sheets in this general reference map series have been published for areas in the United States but the national coverage is incomplete.

National Parks, Monuments, and Historic Sites Maps, priced at $.50 and $1.00 each. Over 45 topographic maps show some of the nation's important recreational areas. Scales vary from 1:960 (Franklin D. Roosevelt National Historic Site, New York) to 1:250,000 (Mt. McKinley National Park, Alaska). Other national park maps in this series covers Acadia, Bryce Canyon, Carlsbad Caverns, Crater Lake, Glacier, Grand Canyon, Grand Teton, Great Smoky Mountains, Isle Royale, Lassen Volcanic, Mammoth Cave, Mesa Verde, Mount Rainier, Olympic, Rocky Mountain, Sequoia and Kings Canyon, Shenandoah, Yellowstone, Yosemite, and Zion.

State Maps. Base maps which show counties, cities, and towns, railroads, and water features are published for all states except Hawaii. Most are available at 1:500,000, priced at $1.00 each, and at 1:1,000,000, priced at $.50 each. Topographic maps are available for most states and generally at 1:500,000, priced at $1.50 or $2.00 each. In both base maps and topographic maps, small states, such as New Hampshire and Vermont, are combined on a single sheet while large states, such as Alaska, Texas and California, are divided into two or more sheets.

Shaded Relief Maps, priced between $.50 and $2.00 each, depending on sheet size and series. Selected topographic quadrangles, state maps, 1:250,000 sheets, and national park and monument maps are published in a special hill shading edition which can be extremely effective for teaching purposes. Scales vary from 1:4,800 to 1:2,500,000.

National Atlas Maps, each sheet 19" X 28" and sold separately at $1.00 to $1.50 each, as published. Under compilation is a 475 page National Atlas of the United States. Most of this atlas will consist

> of thematic maps on such diverse subjects as geology, soils, natural vegetation, climate, water, history, agriculture, forestry, fishing, minerals, recreation, manufacturing, employment, business, government, transportation, population, administration, and education. Fifteen sheets, 13 on physical features and 2 on population, had been published by June, 1968.

In Washington, D.C., the Geological Survey maintains a map information office (address previously given), a library, and a museum. Here and at seven public inquiry offices, a complete library of Survey maps and other publications is available for consultation. Location of public inquiry offices:

Room 15426 Federal Building
1961 Stout Street
Denver, Colorado 80202

8102 Federal Office Building
125 South State Street
Salt Lake City, Utah 84111

602 Thomas Building
1314 Wood Street
Dallas, Texas 75202

Room 7638 Federal Building
300 North Los Angeles Street
Los Angeles, California 90012

Room 504 Custom House
555 Battery Street
San Francisco, California 94111

South 157 Howard Street
Spokane, Washington 99204

Room 108 Skyline Building
508 - 2nd Avenue
Anchorage, Alaska 99501

Other publications free on request include:

U.S. Geological Survey, 12 pp. Explains the mission of the agency and its varied operations.

Topographic Mapping, 32 pp. Discusses compilation and use of topographic maps and opportunities for a career in professional mapping in the Geological Survey. Extremely well illustrated.

Maps of the Geological Survey may be purchased by mail from the Survey or over-the-counter at the public inquiry office and from commercial dealers. If purchased directly from the Survey, a discount of 20 percent is allowed on single orders of $20.00 or more and 40 percent on single orders of $100.00 or more, based upon list price. Thus, when purchasing in quantity for classroom sets, 1:24,000 topographic maps which list at $.50 each are available for only $.30 each. Maps covering areas in states west of the Mississippi River (including all of Louisiana and Minnesota) should be ordered from:

Distribution Section
U.S. Geological Survey
Federal Center
Denver, Colorado 80225

Maps of areas east of the Mississippi River should be ordered from:

Distribution Section
U.S. Geological Survey
1200 South Eads Street
Arlington, Virginia 22202

A single order combining both eastern and western maps may be placed at either office. Commercial agents of Geological Survey maps are given in the commercial map dealer listing that follows in the next section of this chapter.

OCEANOGRAPHIC OFFICE, U.S. Navy

This agency prepares hydrographic charts of foreign areas and aeronautical charts. While its products are specifically designed for use of the U.S. Navy, many are sold to the general public. General and specialized nautical charts on a variety of scales are priced from $.30 to $2.60. Aeronautical charts in several series and scales are priced from $.60 to $1.50 each. Price lists and map indexes available include these:

Catalogue of U.S. Navy Aeronautical Charts

Catalogue of Nautical Charts

Catalogue of Oceanographic Office Technical Reports and Special Publications

An Ocean Science Study Kit has been assembled to provide secondary schools with introductory information on oceanography and ocean engineering. The kit includes reading materials, charts, and exercises in contouring, charting, and data interpretation. Both student and teacher kits are available; the latter contains the same items as the former plus additional information to give the teacher background in providing guidance to the student. The student kit is priced at $1.60 each and the teacher kit at $3.20 each.

Mapping and other programs of the Oceanographic Office are explained in this publication:

The Oceanographic Operations Program of the U.S. Navy, 1967, 109 pp., $.50, available through the Superintendent of Documents.

For general information on charting and other programs, inquiries may be addressed to:

Commander
U.S. Naval Oceanographic Office
Washington, D.C. 20390

Nautical and aeronautical charts are sold over-the-counter by branch Oceanographic offices in Norfolk, Virginia; Honolulu, Hawaii; Wilmington, California; Rodman, Canal Zone; Yokosuka, Japan; and by about 85 commercial outlets in the United States. A few of the commercial outlets that stock Oceanographic Office nautical charts are indicated in the listing of map dealers that follows in the next section of this chapter. A complete list of these outlets is available, upon request.

Requests for catalogues and mail orders for aeronautical charts, nautical charts, and the Ocean Science Study Kit from purchasers west of the Mississippi River should be sent to:

Naval Oceanographic Distribution Office
Clearfield
Utah 84016

Requests for catalogues and mail orders for aeronautical charts, nautical charts, and the Ocean Science Study Kit from purchasers east of the Mississippi River should be sent to:

Naval Oceanographic Distribution Office
U.S. Naval Supply Depot
5801 Tabor Avenue
Philadelphia, Pennsylvania 19120

SOIL CONSERVATION SERVICE, U.S. Department of Agriculture

The Department of Agriculture has published soil surveys since 1899. They contain soil maps, general information about the agriculture and climate of the area, and descriptions of each kind of soil found in the area. These surveys are issued on a county or larger area basis. Soil surveys published since 1957 contain soil maps printed on a photomosaic base and are far more informative and usable than previous survey maps. Map scales commonly used are 1:20,000 or 1:15,840.

A soil survey that is still in print may be obtained in one of the following ways:

(1) Land owners or operators in the area surveyed and professional workers who have use for the survey can obtain a free copy from the local office of the Soil Conservation Service, from their county agent, or from their congressman. Those outside the area can obtain a free copy from the Information Division.

(2) For a time after publication, copies may be purchased from the Superintendent of Documents.

(3) Many libraries keep published soil surveys on file. Also, soil conservation district offices and county agricultural extension offices have copies of the local soil surveys that may be used for reference.

For a detail list of published soil surveys and other information, address:

Information Division
Soil Conservation Service
U.S. Department of Agriculture
Washington, D.C. 20250

TENNESSEE VALLEY AUTHORITY (TVA)

This agency issues 1:24,000 topographic maps of its area following the standards of the Geological Survey, navigation charts of TVA reservoirs and of the Tennessee River and its tributaries, recreation maps of Tennessee Valley lakes, and many other special purpose maps and charts. Maps are priced from $.20 to $1.00 each. Index maps of major series and a price catalogue are available. Two free pamphlets are of particular interest:

How Topographic Maps Are Made, 1965, 28 pp. Present day methods of topographic map preparation are explained clearly. Illustrations include an aerial photograph, manuscript map, scribe sheet, and printing plate impressions from culture, contour, drainage, and road plates.

Surveys, 1967, 65 pp. Outlines the mapping programs and other work of the Maps and Surveys Branch, TVA.

TVA maps, index sheets, price catalogues, and the pamphlets mentioned above may be secured from:

Map Information and Record Unit
Tennessee Valley Authority
110 Pound Building
Chattanooga, Tennessee 37401

Map and Engineering Records Section
Tennessee Valley Authority
102-A Union Building
Knoxville, Tennessee 37902

Topographic and other maps of the TVA also may be purchased from the U.S. Geological Survey. General information on the many activities of the TVA may be secured from:

Tennessee Valley Authority
Information Office
324 New Sprankle Building
Knoxville, Tennessee 37902

WEATHER BUREAU, U.S. Department of Commerce

The Bureau issues a daily weather map and a number of climatic maps and charts of the United States. For general information on Weather Bureau activities, address inquiries to:

Weather Bureau
U.S. Department of Commerce
Washington, D.C. 20235

Sales of all maps and other publications of the Weather Bureau are handled by the Superintendent of Documents. Price list 48, "Weather, Astronomy, and Meteorology," secured from the Superintendent of Documents, lists the Weather Bureau publications.

Subscription to the Daily Weather Map is $9.60 a year, $2.40 for three months. Classroom sets of weather maps for specific dates can be obtained if an order is placed with the Superintendent of Documents two weeks in advance of issue. The price is $.03 each map (minimum 5 copies); 20 percent discount when 100 or more copies are mailed to the same address.

State Government Maps

State mapping agencies exist in every state and often can be discovered by examining state government literature. Some of the state agencies often issuing maps are: geological surveys; planning commissions; conservation commissions; fish and game commissions; zoning boards; drainage districts; reclamation commissions; engineers; highway departments; soil conservation districts; tourist commissions. As part of the continuing cooperative federal-state highway planning program, highway departments in most states issue county highway maps. Most states produce an official state road map, free for the asking. Various county and city agencies or departments also issue maps or have pertinent local maps available from which copies may be made, when needed. Most cities of 10,000 population or more have a chamber of commerce from which city maps may be obtained.

Geographical Society Maps

In the United States two geographical societies issue a number of useful maps.

AMERICAN GEOGRAPHICAL SOCIETY publishes several series of high quality small scale maps. These include:

Hispanic America, 1:1,000,000, part of the International Map of the World on the Millionth Scale. There are general reference maps and there is a complete coverage of Latin America in 107 sheets, $2.50 each.

World, 1:5,000,000, a recent and useful series showing physical and cultural features, 18 sheets, $4.00 each.

The Americas, 1:12,500,000, general purpose reference map, 34" X 54", $2.50.

Atlas of Diseases. This is a fascinating series of world maps showing distribution of major diseases and of studies in human starvation. Individual sheets of this series are sold separately. 17 sheets, each 25" X 38", $1.50 each.

For indexes and the latest price list of these and other publications, write:

American Geographical Society
Broadway at 156th Street
New York, New York 10032

NATIONAL GOEGRAPHIC SOCIETY publishes a series of political maps covering all sections of the world. Some four to six new maps are issued annually, free to subscribers of the magazine. Current maps are part of an atlas folio (cover available). These maps are good general reference maps and contain numerous place names often not found on maps of such relatively small scale. Reasonably priced, the purchaser does not have to be a magazine subscriber to order National Geographic maps. Atlas series maps (about 45 available), each 19" X 25", are $.50 each. Wall maps (over 40 available) in paper are priced at $1.00 each and in fabric at $2.00 each. The Society also has various globes and other maps for sale including two large mural maps of the world, one political and the other physical, each 12 1/2 feet by 8 1/2 feet (four sheets each) priced at $40.00 and $50.00 each. For the latest price list and other information write to:

National Geographic Society
17th and M. Streets, N.W.
Washington, D.C. 20036

Foreign Government Maps

Many foreign government maps, especially those from Western European nations and Commonwealth countries, are almost as easy to obtain as American-made maps. Other foreign maps are more difficult to obtain due to security reasons and the great distance; detailed topographic maps from most Communist nations are nearly impossible to secure. For purchasing foreign maps, refer to commercial sources (next section of this booklet) or write embassies of the individual countries in Washington, the Pan American Union in Washington, or to the Map Library of the United Nations in New York. Many Washington embassies will furnish free on request very worthwhile general maps of their country; other maps they may send are considerably less useful.

Indexes and catalogues of foreign government mapping agencies are available but the catalogues are more often sold than given away free. Because obtaining the catalogues and ordering and obtaining the maps can be an extremely slow process, it is generally easier to use the services of a central sales agent such as International Map Co., Inc., or Edward Stanford, Ltd. (addresses found in final section of this booklet). Current Stanford map bulletins list topographic, physical, political, economic, geological, and other maps and atlases from over 150 countries and colonies including such far-flung areas as Albania, Basutoland, Iceland, Liechtenstein, Mauritius, Papua, and the Windward Islands. Telberg Book Corp. (address found in last section of this booklet) handles Communist area maps and foreign geological maps.

For Canadian topographic maps and indexes, write:

Map Distribution Office
Dept. of Mines and Technical Surveys
Ottawa, Canada

One particularly useful group of general world sheet maps is in the International Map of the World on the Millionth Scale (1:1,000,000). Several score of mapping agencies throughout the world have contributed sheet maps to this series and the world is now almost completely covered by this series. (1,121 maps at the scale 1:1,000,000 are needed to cover all the world's land areas.) The Department of Economic and Social Affairs, United Nations, New York, is the cooperating agency in directing this series and issues an annual report (price $1.50) on the series. Sheets of this series (at various prices) may be obtained from U.S. Geological Survey, Army Map Service, Dept. of Mines and Technical Surveys (Canada), International Map Company, Edward Stanford, Ltd., and the American Geographical Society.

Small scale generalized coverage maps showing the availability of topographic maps, soil maps, geologic maps, and aerial photographs throughout Latin America were issued by cooperating agencies of the Organization of American States in 1962. These were followed by detailed country atlases (17" X 22"), each containing indexes showing aerial photographs, topographic and planimetric maps, geologic inventory maps, and information on scales, dates, agencies, map content, and availability. In 1965, atlases of these countries were issued:

Argentina
Bolivia
Brazil
Chile
Colombia
Costa Rica
Dominican Republic
Ecuador
El Salvador
Guatemala
Haiti
Honduras
Mexico
Nicaragua
Panama
Paraguay
Peru
Uruguay
Venezuela

These atlas-indexes are $3.00 each and are available from:

Natural Resources Unit
Department of Economic Affairs
Pan American Union
Washington, D.C.

6. MAPS, GLOBES, RELIEF MODELS, MAP TRANSPARENCIES, AND RELATED MATERIALS FROM COMMERCIAL SOURCES

Maps and related cartographic materials specifically designed for classroom use or suitable for classroom use are produced by numerous commercial firms in the United States and abroad. The variety of cartographic products is so great that it is impossible to list all the products of each firm. However, all major commercial firms issue catalogues or other lists, and copies of these may be obtained by writing the firms directly. The following lists include major commercial firms engaged in producing and/or selling classroom cartographic materials as well as many firms that have available cartographic materials suitable for classroom use although not specifically designed for that use. No pretense is made to provide complete lists. Since many manufacturers of and agents for classroom materials are listed more than once, their complete addresses are listed separately at the end of this booklet.

Wall Maps

*American Map Co.
Benefic Press
Cenco Scientific Co.
Civic Education Service
George F. Cram Co.
*Denoyer-Geppert Co.
Hammond, Inc.
Herne Brothers
Modern School Supply Co.
*A. J. Nystrom and Co.
Rand McNally and Co.
Weber Costello Co.

(*also markets foreign, especially European, wall maps)

Desk Outline Maps

American Map Co.
Cenco Scientific Co.
University of Chicago, Dept. of Geography
George F. Cram Co.
Denoyer-Geppert Co.
Hammond, Inc.
A. J. Nystrom and Co.
Rand McNally and Co.
Teachers Publishing Co.

Other Sheet Maps

Argosy Book Stores (old maps)
General Drafting Co. (state road maps)
H. M. Gousha Co. (state road maps)
Hammond, Inc. (Lobeck landform maps)
Herne Brothers (city maps)
Historic Urban Plans (old map reproductions)
Hubbard Scientific Co. (topical maps)
International Map Co. (foreign sheet maps)
Jeppeson and Company (reference relief maps & airline maps)
H. P. Kraus (old maps)
Map Corp. of America (city maps)
Michelin Tire Corp. (European and African road maps)
Orbis Terrarum (old maps)
Erwin Raisz (landform maps)
Rockford Map Publishers (property ownership maps & atlases)
Rand McNally and Co. (state road maps)
R. R. Donnelly and Co. (state road maps)
Sanborn Map Co. (diagrammatic maps and atlases of over 11,000 urban areas--practically every town in the U.S. of 2,000 population or more)
Edward Stanford, Ltd. (foreign sheet maps)
L. S. Straight (old maps)
Thomas Brothers (city maps)
Telberg Book Corp. (maps of Communist areas; foreign geological maps)
News Map of the Week (weekly news map)

Map Transparencies (for overhead projectors)

Allyn and Bacon
American Map Co.
Cenco Scientific Co.
Denoyer-Geppert Co.
Encyclopedia Britannica Films
Hammond, Inc.

Instructo Products Co.
Modern School Supply Co.
A. J. Nystrom and Co.
Popular Science Publishing Co.
Rand McNally and Co.
Teachers Publishing Co.
Valiant Instructional Materials Corp.
Ward's
Weber Costello Co.

Globes

Aero
Benefic Press
CBS Learning Center
Cenco Scientific Co.
George F. Cram Co.
Denoyer-Geppert Co.
Farquahar Transparent Globes
Hammond, Inc.
Hubbard Scientific Co.
McGraw-Hill Films
A. J. Nystrom and Co.
Rand McNally and Co.
Ward's
Weber Costello Co.

Raised Relief Models

Cenco Scientific Co.
Denoyer-Geppert Co.
Hubbard Scientific Co.
Kistler Graphics
A. J. Nystrom and Co.
Ward's

Demonstration and Other Equipment

(charts, map reading and projection models, planetariums, other laboratory equipment)

Benefic Press
Cenco Scientific Co.
George F. Cram Co.
Denoyer-Geppert Co.
Farquahar Transparent Globes
Hubbard Scientific Co.
Rand McNally and Co.
Ward's
Weber Costello Co.

Map Agents in the United States

A complete list of retail map dealers in the United States would be too lengthy to include in this booklet. The agents listed here were selected because they stock U.S. Geological Survey topographic maps, valuable in geography studies. Most of the map agents carry Geological Survey maps of their state or region only and usually sell these at prices higher than the Geological Survey list prices quoted previously. Sales by these dealers are not limited to Geological Survey maps and many sell street maps, wall maps, nautical and aeronautical charts, and a wide variety of other government and commercial maps.

Agents selling these maps are specifically marked by number:

(1) Also stocks Coast and Geodetic Survey nautical charts

(2) Also stocks Oceanographic Office nautical charts

(3) Also stocks Coast and Geodetic Survey aeronautical charts.

ALABAMA

ANNISTON: Sawyer Office Supplies, Inc., 21 E. Eleventh St.

BIRMINGHAM: Electric Blue Printing Co., Inc., 310 N. 21st. St.
Patton-Harris Co., Inc., 2113 First Ave. North
Resource Management Service, Highway 280, South

ALASKA

ANCHORAGE: Alaska Petroleum Map Service, 212 6th. Ave.

CORDOVA: Karl's Hardware (1)

DELTA JUNCTION: Robert L. Jenks, Box 996

FAIRBANKS: Fairbanks Office Supply, 551 Second Ave.

HAINES: Powell's

HOMER: Sporter Arms Co., Airport Road (1)

KETCHIKAN: Service Electric Co., Inc., 744 Water St. (1) (2)

KODIAK: Kodiak Marine Supply, Inc., Rezonof Dr. (1)

MEDFRA: Jack & Nadine Smith, Medfra Trading Post

NOME: Nome Drug Store

PETERSBURG: Hobby Shop

SEWARD: Durant's Hardware, P. O. Box 737 (1)

SITKA: Sitka Arts & Crafts, Box 138

SOLDOTNA: Charles L. Parker, Sterling Highway NW (1) (3)
Benn's Hardware, Box 390

SPENARD: Hewitts Drug Store, Inc., Minnesota Dr.

VALDEZ: Valdez Gift & Sport Shop, 419 McKinley St.

YAKUTAT: Mallott's General Store, Box 158 (1)

ARIZONA

PHOENIX: Ace Photo Copy Service, Inc., 124 W. McDowell Rd.
Arizona Automobile Assoc., 748 E. McDowell Rd.
Arizona Blueprint Co., 333 N. 3rd. Ave.
High Adventure Hdgtrs., 4117 W. Clarendon Ave.
Phoenix Blueprint Co., 4141 N. Seventh St.

TEMPE: Phoenix Blueprint Co., 408 Mill Ave.

TUCSON: Arizona Automobile Assoc., 228 W. Drachman St.
Mailing Bureau, University of Arizona
Prima Blueprint Co., Inc., 4655 E. Broadway
Reproductions Inc., 234 E. Sixth St.
Tucson Blueprint Co., 537 N. Sixth Ave.

ARKANSAS

FORT SMITH: Southern Reproduction & Supply Co., 19 N. 5th. St.

LITTLE ROCK: Arkansas Geol. Commission, 446 State Capitol Bldg.

TEXARKANA: Wilson Engineering Co., 204 E. Third St.

CALIFORNIA

ALTURAS:	Monroe's Sporting Goods, 231 N. Main
ANAHEIM:	Trail/Design, 1282-84 S. Magnolia St.
ANDERSON:	Shasta Engineers & Surveyors, 2979 E. Center St.
BAKERSFIELD:	Price Blueprint & Supply Co., 1600 G. St.
BARSTOW:	Lenwood Blueprint, 25570 W. Main St.
BELLFLOWER:	Gen'l. Electronic Detection Co., 16238 Lakewood Blvd.
BERKELEY:	Lucas College Book Co., Inc., 2430 Bancroft Way (1) The Ski Hut, 1615 University Ave.
BIG PINE:	Camera Art Shop
BISHOP:	Brocks Sporting Goods, 100 N. Main Pinon Bookstore, 206 N. Main St.
BRIDGEPORT:	Ken's Sporting Goods, Main St., P.O. Box 544
BLYTHE:	Eldo Engineers, 175 S. Spring St.
CHICO:	Photo-Tech, Inc., 330 Flume St.
CULVER CITY:	Wayne E. K. Nielsen & Assoc., 11276 Barman Ave.
CUPERTINO:	Antelope Camping Equipment, 10268 Imperial Ave.
DEATH VALLEY:	Death Valley Natural History Assoc.
EL CENTRO:	McCoy's Office Supply, Inc., 626 Main St.
ESCONDIDO:	Palomar Blue Print, 446 N. Quince
EUREKA:	C. O. Lincoln Co., 615 Fifth St. (1)
EXETER:	Mixter's Pharmacy, 204 E. Pine St.
FRESNO:	Herb Bauer Sporting Goods, 1316 Blackstone Ave. Mid-Valley Sports Center, 5350 N. Blackstone Ave. Progressive Map Service, 401 N. Fresno St. Roos/Atkins, 1212 Fulton St. Western Blue Print & Supply Co., 1854 Fulton St.
GLENDALE:	Glendale Blue Print Co., 120 S. Orange St.
GOLETA:	Valley Blueprint Co., 1359 Norman Firestone Rd.
GRASS VALLEY:	Allert & Bassett Litho Blueprint, 240 Mill St.

INGLEWOOD: Jonas Ski & Hike, Inc., 820 N. La Brea Ave.

JACKSON: Walter Hardgrove, 102 Water St.

JOSHUA TREE: E. B. Moore Co., Inc., 61732 Twenty-Nine Palms Hwy.

LA CANADA: Sport Chalet, 951 Foothill Blvd.

LANCASTER: Antelope Valley Blueprint Co., 655 W. Ave. (1)
The Gunshop, 44633 N. Sierra Hwy., P.O. Box 542

LONG BEACH: Ace Blueprint Co., 2491 Long Beach Blvd. (1)

LOS ANGELES: Map Service Co., 1100 S. Beverly Dr. (1)
The Map Shop, 1634 Westwood Blvd. (3)
Wayne E. K. Nielsen & Assoc., P.O. Box 66-444
Westwide Maps Co., 114 W. Third St.
Zeitlin & Ver Brugee, 815 N. La Cienega Blvd.

LOS GATOS: H. J. Crall Co., 21 N. Santa Cruz Ave.

LYNWOOD: Pacific Coast Map Service, 12021 Long Beach Blvd.(1)

MARYSVILLE: Hall's Office Supplies, 527-29 E. St.
Photo-Tech, Inc., 523 E. St.

MODESTO: Valley Sporting Goods, 1418 Jay St.

OAKLAND: Harry Freese, Map Publisher, 337 Seventeenth St.

OCEANSIDE: Avery and Associates, 306 Kelly St.
Bell Blueprint, 608 Vista Way

OROVILLE: Arnold's Stationery, 1944 Bird St.
Moseley's Blueprinting, 2120 Lincoln St.

PALM DESERT: Desert Agents, Del Gagnon Co., 73-612 Hwy. 111

PALO ALTO: Peninsula Scientific, 2185 Park Blvd.

PANORAMA CITY: Valley Map Center, 8222 Ranchita Ave.

PARADISE: Allan's Sporting Goods, 484 Pearson Rd.

PARAMOUNT: Bill's Service Center, 15502 S. Paramount Blvd.

PASADENA: Pasadena Map Co., 148 E. Colorado Blvd.

PLEASANT HILL: The Sport Chalet, 3303 N. Main St.

QUINCY: Gold Pan Service, California Hwy. 70, North

REDONDO BEACH: Pat's Ski & Sport Store, 115 Palos Verdes Blvd.

REDWOOD CITY: P I T, 3865 Jefferson Ave.

RIDGECREST: Desert Office Supply & Book Corral, 126 Balsam St.
The Gift Mart, 211 Balsam St.

RIVERSIDE: Mission Blue Print Co., 3860 Seventh St.
Riverside Blueprint, 4295 Main St.

SACRAMENTO: A-1 Map Center, 3271 Folsom Blvd. (1)
Ed's Liquor & Sporting Goods, 2328 Fair Oaks Blvd.
Ogden Surveying Equipment Co., 5520 Elvas Ave. (1)

SAN BERNARDINO: San Bernardino Blue Print Co., 429 Third St.

SAN DIEGO: Aztec Shops, Ltd., San Diego State College
Rodney Stokes Co., 870 Third Ave.
The Engineers' Service Co., 822 Sixth Ave.

SAN FRANCISCO: Rand McNally Map Store, 423 Market St. (3)
Thomas Bros. Maps, 550 Jackson St.

SAN JOSE: Curtis Lindsay, Inc., 77 S. First St.

SAN RAFAEL: Cuthbert's Blueprint & Photoprint Service,1033 C St.

SANTA BARBARA: Coast Blue Print Co., 325 State St.

SANTA CRUZ: Bowman & Williams, 211 Vine St.
Plaza Books & Stationery, 924 Main St.

SANTA PAULA: Milum's Gifts & Stationery, 924 Main St.

SOUTH GATE: E. R. Jacobsen, 9322 California Ave. (1)

STOCKTON: Morris Brothers, 630 N. California St.

SUSANVILLE: Cobels Stationers, 703 Main St. (1)

TARZANA: Back Country Book Store, 6660 Roseda Blvd.

TRONA: Wildrose Station Resort, Death Valley Natl. Monument

VAN NUYS: Land Engineering Co., Suite 509, 6842 Van Nuys Blvd.

VENTURA: County Stationers Inc., P.O. Box 381 (1)

VISALIA: Togni-Branch, 114 East Main St.

YREKA: Tyrer's Stationery & Books, 210 S. Broadway

COLORADO

ARVADA: Bookland, Arvada Plaza Shopping Center, 9262 W. 58th. Ave.

ASPEN: Kandahar-Holubar, 426 E. Main St.

BOULDER: University Book Store, Univ. of Colorado

CARBONDALE: Alco-Maps, Blue Line Prints, Hwy. 133

COLORADO SPRINGS:
A & E Rock Shop, 209 W. Brookside St.
The Chinook Bookshop, 208 1/2 N. Tejon St.
Out West Printing & Stationery Co., 11 E. Pikes Peak Ave.

CREEDE: Ramble House

DENVER: Christy Sports, Inc., 9885 W. Colfax Ave.

DURANGO: Richey's Store, 920 Main St.

ENGLEWOOD: Book House, Brookridge Shopping Center, 5174 S. Broadway

ESTES PARK: Western Brands, 129-139 E. Elkhorn Ave.

GRAND JUNCTION: Quahada Engineering, 236 Main St.

GREELEY: Strout Realty, 1949-26th. Ave. Ct.

GUNNISON: Gunnison Newspapers, Inc., 218 N. Wisconsin St.
Skyline Reproductions, 516 N. Pine St.

HIDEAWAY PARK: Alpine Shop

LAKE CITY: Timberline Craftsman, Silver St.

LEADVILLE: Cass's, 706 Harrison Ave.
Leadville Surplus & Sporting Goods, 1001-9 Poplar St.

LITTLETON: Marcas Enterprises Co., 6685 S. Sherman
The Outdoorsman, 89 W. Littleton Blvd.

MONTROSE: Burton Map Service, Post Office Bldg.

SALIDA: Robert F. Harrison & Assoc., Inc., 124 E. 2nd St.

SILVERTON: The Silverton Standard & The Miner, Box 187

STERLING: Schure's Camera & Sporting Goods, 118 N. Third St.

WHEAT RIDGE: Village Book Shop, 3300 Youngfield St.,
Applewood Village

CONNECTICUT

DURHAM: Majorie C. Hatch, Town Clerk's Office, Town Hall

GROTON: Allin's Office Supply, 787 Long Hill Rd., Box O

HARTFORD: Connecticut State Library, 231 Capitol St.

NEW HAVEN: Frank Fargo of New Haven, Inc., 193 Church St.
(1) (2)
C. E. H. Whitlock, 15 Broadway

NEW LONDON: J. Solomon, Inc., 30 Main St.

NEW MILFORD: Bogie Marine, Inc., Candlewood Pt., RR. No. 2

SALISBURY: Housatonue Bookshop

SHARON: Sharon Book Center, W. Main St.

WINSTED: Alyn Book & Gift Shop, 450 Main St.

DELAWARE

WILMINGTON: Butler's Inc., 415 Market St.
Paul Wick Ski Shops, Inc., 1201 Philadelphia Pike
Wilmington Blue Print Service, 817 1/2 Tatnall St.

DISTRICT OF COLUMBIA

WASHINGTON: Rand McNally Map Store, 1636 I St., N.W. (1)(2)(3)

FLORIDA

BARTOW: W. A. Read, Jr. & Associates, Bldg. 33D,
Bartow Munc. Airport

FORT LAUDERDALE:
Dolph Map Co., Inc., 430 N. Federal Hwy.

FORT MYERS: Gulf Maps, 16 Patio De Leon

FORT PIERCE: Horton's, 122 N. Second St. (1)

GAINESVILLE: Campus Shop & Book Store, Univ. of Florida
Florida Book Store, Inc., 1614 W. University Ave. (1)

JACKSONVILLE: A. R. Cogswell Supply Co., 433 W. Bay St.
The H. & W. B. Drew Co., 22-30 W. Bay St.
The Nautical Supply Co., 213 E. Bay St.(1)(2)

LAKELAND: Edwards Surveying & Blueprinting, 1218 E. Main St. (1)

LAKE WALES: Polk Engineering Co., Walesbilt Hotel Bldg.

MIAMI: Hopkins-Center Hardware Co., 3701 N.W. 21st. St. (1) (2)
Lyons Map Co., 312 Dade Commonwealth Bldg., 139 NE First St.
T-Square Miami Blueprint Co., Inc., 635 S.W. First Ave.

NAPLES: Caple's Blueprinting, 636-9th. St.,N. Caple Arcade

ORANGE CITY: Mauncy Engineering, 1425 S. Volusia Ave.

ORLANDO: Denmark Sporting Goods,Inc., 149 N. Magnolia St.
George Stuart, Inc., 133 E. Robinson St.

PANAMA CITY: Harby Marina, Inc., 1055 E. Business Hwy. 98 (1)

PUNTA GORDA: Renshaw Press, 222 Brown St.

ST. PETERSBURG: St. Petersburg Map & Blue Print Co., 657 First Ave., S.

SARASOTA: Ellie's Book & Stationery, 1350 Main St.

STUART: Valentine's Bookshop, 329 E. Ocean Blvd.

TALLAHASSEE: Jon S. Beazley, Photogrammetric Engineers, 1903 N. Monroe St. (1)

TAMPA: Poston Marine Hardware & Supply Co., 1012 E. Cass St. (1) (2)

WEST PALM BEACH:
Hopkins Marine Hardware Co., 207 Sixth St. (1)(2)

GEORGIA

ATLANTA: Department of Mines, Mining, and Geology, 19 Hunter St., SW

COLUMBUS: The White Co., 1220 First Ave.

SAVANNAH: Savannah Blue Print Co., 11 E. York St.

HAWAII

CAPTAIN COOK: Earl Glass

HILO: The Book Nook, 94-98 Keawe St.

HONOLULU: Trans-Pacific Instrument Co., 1406 Colburn St. (1) (2) (3)

KAHULUI, MAUI: Sue's Stationery, Inc. (1) (3)

IDAHO

BOISE: Jensen-Graves Co., 210 N. Eighth St.

KETCHUM: Sturtevant of Sun Valley, One Sun Valley Rd.

McCALL: May Hardware, 36 Lakes St.

REXBURG: Porter's Book Store, 21 College Ave.

SANDPOINT: Eclipse Printery, 411 N. Second Ave.

ILLINOIS

CHICAGO: Rand McNally Map Store, 124 W. Monroe St. (3)

CRYSTAL LAKE: Brainard's Bookstore, 53 Brink St.

PARK FOREST: Dickinson's, 214 Early St.

URBANA: Illinois State Geological Survey, 136 Natural Resources Bldg.

INDIANA

BLOOMINGTON: Indiana Geological Survey, Indiana University

EVANSVILLE: Ridgway's Photo Copy, Inc., 313 Main St.

INDIANAPOLIS: Div. of Water, Dept. of Natural Resources, 100 N. Senate Ave.

IOWA

AMES: University Book Store, Iowa State University

DES MOINES: Des Moines Stationery Co., 507 Locust
Hyman's Book Store Inc., 405 Sixth Ave.
Office Supplies Inc., 411 Sixth Ave.
Storey-Kenworthy Co., 309 Locust

IOWA CITY: Director, Iowa Geological Survey, Geological Survey Building

KANSAS

LAWRENCE: Kansas State Geological Survey, Univ. of Kansas

WICHITA: Orr's Inc., 2226 E. Douglas St.

KENTUCKY

CALHOUN: T. Herbert Crawley, Calhoun Drug Center

FRANKFORT: Dept. of Commerce, Bush Bldg,, Wapping St.

GLASGOW: Pride Engineering Co.

LEXINGTON: Kentucky Geological Survey, Mineral Industries Bldg., 120 Graham Ave.

LOUISA: Laban E. Wallace, Jr.

OWENSBORO: Johnson, Depp, and Quisenberry, 2625 Frederica St.

LOUISIANA

ALEXANDRIA: Allen's Blue Print & Supply Co., 415 Johnston St.

NEW ORLEANS: The New Orleans Map Co., 110 Exchange Place (1)

SHREVEPORT: Globe Map Co., 311 Milam St.

MAINE

AUBURN: Sharlaine Products, Inc.,104 Washington St.

AUGUSTA: Merrill's, Inc., 221 Water St. (1)

BANGOR: Dakin Sporting Goods Co., 28 Broad St.
Wight Sporting Goods, 54 State St.

BAR HARBOR: Sherman's Book and Stationery Store

BATH: Shaw's Book Store, 49 Front St. (1)

BELFAST: Palmer's Stationery Store, 27 Main St.

BLUE HILL: Candage Hardware & Supply (1)

BOOTHBAY HARBOR: The Smiling Cow

BRUNSWICK: Pelletier's Sporting Goods, 189 Pleasant St.

CALAIS: Todds Hardware

CAMDEN: The Village Shop, 25 Main St. (1)

CARIBOU: Briggs Hardware Co., 14 Sweden St.

COOPERS MILLS: Howe Fur Co.

DAMARISCOTTA: The Old Maine Shop, Main St. (1)
DEXTER: Dexter Hardware, Inc.
DIXFIELD: Towle's Hardware, Weld St.
EASTPORT: S. L. Wadsworth & Son, 5-8 Central Wharf (1)(2)
ELLSWORTH: J. A. Thompson Co., 119 Main St.
H. F. Wescott Hardware Co., 120 Main St. (1)
FAIRFIELD: Mark McPheters, Upper Main St.
FARMINGTON: Pearsons, 29 Broadway
FREEPORT: L. L. Bean, Inc.
FRYEBURG: Louis Solari, Solari's Store
GARDINER: Webber's Variety Store, 287 Water St.
GREENVILLE: D. T. Sanders & Sons, Inc., Moosehead's Old Country Store
The Indian Store
HOULTON: Almon H. Fogg Co.
JACKMAN: Smith Hardware, Inc.
KENNEBUNK: R. W. Libby & Sons, Main St.
KITTERY: Webber's Gun & Marine, Interstate Hwy. 95
LEWISTON: Victor News Co., 50 Ash St.
LINCOLN: Lincoln Sport Shop
LUBEC: Lubec Sporting Goods Store, Water St.
MACHIAS: Western Auto Associate Store (1)
MEXICO: Dawson's Sporting Goods, 5 Roxbury Rd.
MILLINOCKET: S. J. Hikel Store, 78-80 Penobscot Ave.
MOUNT DESERT: O. F. Karban, Echo Vista
NORWAY: Woodman's Sporting Goods
OLD TOWN: Ross Sporting Goods, 27 N. Maine St.
ORONO: University Store

PORTLAND:	Campbell's Bookstore, 604 Congress St. The Harris Co., 188 Commercial St. (1)(2) Loring, Short & Harmon, Monument Square
PRESQUE ISLE:	Roy's Army & Navy, State St.
RANGELEY:	G. W. Pickel Store Mo's Variety Store, Main St.
ROCKLAND:	Huston-Tuttle, Inc., 408 Main St.
SACO:	Kennedy's Tackle & Gun Shop, Old Orchard Rd.
SPRINGVALE:	Down-Maine House, 153-157 Main St.
STONINGTON:	Atlantic Avenue Hardware, Inc. (1)
STRATTON:	Wilburs Variety Store, Main St.
WATERVILLE:	Canaan House, 129 Main St.
WILTON:	Cram's Jewelry Store, 74 Main St.
WINTHROP:	Audette's Winthrop Hardware, Bowdoin St.

MARYLAND

ANNAPOLIS:	Weems System of Navig., Jeppeson & Co., 48 Maryland Ave., (1)(2)(3)
BALTIMORE:	Lucas Bros., Inc., 221 E. Baltimore St.
CUMBERLAND:	Torrington Blueprint & Supply Co., 60 Pershing St.
SILVER SPRING:	AIR Photographics, Inc., 2417 Linden Lane
WHEATON:	Photo Science, Inc., 11218 Triangle Lane

MASSACHUSETTS

AMHERST:	A. J. Hastings, Inc.
ANDOVER:	Dana's Sport Shop, 62 Main St.
BOSTON:	J. L. Hammett Co., 48 Canal St. H. A. Shepard & Co., Inc., 22A Beacon St.
BUZZARDS BAY:	Red Top Bait & Sporting Goods Co.
CHATHAM:	Mayflower Shop, 469 Main St. (1)

EDGARTOWN: Avery's, Inc., Main St. (1)

FRAMINGHAM: Laurance Stationery Co., 159 Concord St.

GARDNER: General Sporting Goods Corp., 38 Main St.
Gerroir's Playland, 403-405 Parker St.

GREENFIELD: Barrett & Baker, 306-310 Main St.

LOWELL: G. C. Prince & Son Corp., 108 Merrimack St.

MARBLEHEAD: Fred L. Woods, Jr., 76 Washington St. (1)(2)

MARLBORO: Ted's Sport Shop, 251 Pleasant St.
Wayside Country Store, 1015 Boston Post Rd.

NANTUCKET: Hardy's Inc., 15 S. Water St. (1)

NATICK: Natick Outdoor Store, 23 Washington St.

NEW BEDFORD: C. E. Beckman & Co., 11-35 Commercial St. (1)(2)
Saltmarsh's, 222-226 Union St.

NORTH ADAMS: Lamb Paper Co., 108 Main St.

NORTHAMPTON: Hampshire Bookshop

ORANGE: Stanley Ralys, 265 W. River St.

ORLEANS: H. H. Snow & Sons, Inc.

PITTSFIELD: W. H. Shandoff, Inc., 146 North St.

READING: Reading Marine Sales, 297 Salem St.

SHELBURNE FALLS:
Sawyer News Co., 61 Bridge St.

SHREWSBURY: Underwood Arms Co., Main and Spring Sts.

SPRINGFIELD: Johnson's Bookstore

STOUGHTON: Corcoran, Inc., 2 Canton St.

VINEYARD HAVEN: Martha's Vineyard Shipyard, Inc., Beach Rd. (1)

WESTFIELD: Conner's, Inc., 34 Elm St.

WORCESTER: Irving F. Ephraim, 80 Franklin St.
C. C. Lowell, Inc., 26 Mechanic St.

MICHIGAN

ANN ARBOR: Wahr's Book Store, 316 S. State St.

BIRMINGHAM: W. S. McAlpine Map Co., 1707 S. Woodward Ave.

IRON RIVER: M. E. McCornock, Realtor, 422 Third Ave.

KALAMAZOO: Dykema Office Supply, 119 E. Michigan Ave.

LANSING: Department of Conservation, Engineering Section,
Fourth Floor, Mason Bldg.

PONTIAC: Clark Aerial Survey Corp., 3444 Highland Rd.

WATERSMEET: Barney's Sport Shop

MINNESOTA

DULUTH: A & E Supply Co., 212 W. Superior St.

GRAND MARAIS: Gunflint Lodge
Midway Service Station of Grand Marais, Inc.

HIBBING: Ace Hardware 74, 416-420 E. Howard St.

MINNEAPOLIS: The Hudson Map Co., 721 Third Avenue, South

TOFTE: Karl Hansen, Sawbill Canoe Outfitters

TWO HARBORS: Gamble-Shogmo, Inc.

VIRGINIA: W. A. Fisher Co., 123-125 Chestnut St.

MISSISSIPPI

BILOXI: Bel-Bru Sporting Goods, 119 W. Howard Ave.

JACKSON: Miss. Geol., Econ., & Topo. Survey,
2525 N. West Ave.
Neely Blue Print & Supply Co., Inc.,
517-519 E. Pearl St.

PASCAGOULA: Lewis Sporting Goods Co., 405 Front St.

MISSOURI

KANSAS CITY: Gallup Map & Stationery Co., 1330 Walnut St.

ROLLA: Missouri Geol. Survey and Water Resources,
P.O. Box 250

ST. LOUIS: S. G. Adams Printing & Stationery Co., Tenth & Olive Sts.

MONTANA

BILLINGS: Montana Oil & Gas Conservation Commission, 15 Poly Dr.
Selby Re-print, 114 N. Twenty-seventh St.

BOZEMAN: Beaver Pond, 1700 W. Main St.
The Powder Horn, 35 E. Main St.

BUTTE: Montana Bureau of Mines & Geology, Montana Col. of Mineral Science & Technology

COOKE CITY: Watuck Motor Lodges

EAST GLACIER: Glacier Park Inc.

GREAT FALLS: Blend's Copy Shop, 111 Fifth St., N.
Tribune Office Supply, 417 First Avenue, N.

HELENA: State Publishing Co., 104 Broadway

LIVINGSTON: Dan Bailey, 209 W. Park St.

NEBRASKA

LINCOLN: State Geological Survey, Univ. of Nebraska, 113 Nebraska Hall

VALENTINE: W. J. O'Donnell, P. E., 132 S. Hall St.

NEVADA

BOULDER CITY: Lake Mead Natural History Assn., Nat'l. Park Serv., 601 Nevada Ave.

LAS VEGAS: Arrow Blueprinting Co., 415 Carson Ave.
Las Vegas Blueprint & Photocopy Co., 207 N. 3rd. St.
Mercury Blueprint & Supply Co., 1600 S. Commerce St. (1)
Sarret Office Equipment Co., 427 Fremont St.

RENO: Brundidge's, 227 S. Virginia St.
A. Carlisle & Co., 109 North Sierra St.

NEW HAMPSHIRE

BARTLETT: Franklin H. George

BERLIN: Curtis Hardware Store

BRADFORD: Dickies Bait & Tackle Shop, Route 103
Bradford-Newbury

BRISTOL: Cardigan Sport Store, Inc.

CENTER SANDWICH:
Pearson's Hardware

CLAREMONT: Corner Book Shop, Pleasant St.

CONCORD: Brown & Saltmarch, Inc., 62 N. Main St.
Edson C. Eastman Co., 7 N. Main St.
Gibson's Book Store, Capitol Shopping Center

CONWAY: Roger S. Burnell

DERRY: Great Northern Sports Center, Rockingham Rd.,
Route 28

DOVER: Neal Hardware, Inc., Durham Road

EXETER: Batchelder's Bookstore, 109-113 Water St.

FRANKLIN: Courtois Clover Farm Stores, 417 Central St.

GORHAM: Fiske's Gift Shoppe

HANOVER: Dartmouth Bookstore, 33 S. Main St.

HILLSBORO: Brown's News, Central Square

JAFFERY: David R. Sawyer, Silver Ranch (3)

KEENE: G. H. Tilden & Co., 39 Central Square

KINGSTON: Kingston Outboard Corporation, Route 125

LACONIA: Opechee Trading Post, 13 Opechee St.
Rogers Stationery Store, Inc., 626 Main St.
The Bartlett Shoppe, 641 Main St.

LAKEPORT: John F. Howe, Irwin Marine, Union Ave.

LEBANON: The News Spot, Inc., 3 Hanover St.

MANCHESTER: Goodman's Bookstore, 809 Elm St.
Marks-Savage, Inc., 666 Elm St.
The Lynch Co., Inc., 876 Elm St.

NASHUA: Philip Morris & Co., Main and E. Pearl Sts.

NEWPORT: John R. Kelly Pharmacy, Inc., 5 Main St.
The Corner Pharmacy, 2 Main St.
Towne's Sugar River Pharmacy, Inc., 71 Main St.

NORTH CONWAY: The Mountain Book Shop

PETERBOROUGH: Steele's Bookstore, 39 Main St.

PLYMOUTH: Clays News Stand

PORTSMOUTH: Chauncy B. Hoyt & Co., 47 Market St.
Eberle's Inc., 18 Market Square

ROCHESTER: Ayers & Jenkins, 56 N. Main St.

TILTON: The Sanborn News Agency, 169 Main St.

WEST OSSIPEE: Tice's Gun Shop, Old Route No. 16

WOLFEBORO: Black's Paper Store

NEW JERSEY

BERGENFIELD: Bergenfield Sports & Auto, 61 S. Washington Ave.

CAPE MAY: Carl Boston, 43 Perry St.

CONVENT STATION: General Drafting Co., Inc.

LITTLE FALLS: Phillips Campbell Publishing Co., 19 Meadow Dr.

MATAWAN: Sandford's Pharmacy, 128 Main St.

MONTCLAIR: McCarty Chemical Co., Inc., 86 Park St.

PATERSON: Edwin's Sport Shop, 217 Market St.

TRENTON: Bureau of Geology and Topography, Labor and Industry Bldg., Room 709, John Fitch Plaza

VINELAND: Red Lion Gun Shop, N. Delsea Dr.

NEW MEXICO

ALBUQUERQUE: Albuquerque Blueprint Co., 514 Fourth St., N.W.
Albuquerque Blueprint Co., 613 San Mateo, N.E.
Holman's, 401 Wyoming Blvd. N.E.

EL PRADO: Winslows Map Service, Colonies Road at New Bridge Hwy.

FARMINGTON: San Juan Reproduction Co., 135 N. Airport Dr.

LAS CRUCES: Donald H. Wiese & Co., 545 1/2 N. Main St.

SANTA FE: Southwestern Stationers, 1609 St. Michaels Dr.

SILVER CITY: Herbert L. Watkins, 808 N. Bullard St.

SOCORRO: New Mexico Bureau of Mines and Mineral Resources, Campus Station

TAOS: Kenelm C. Winslow, Bent St.

NEW YORK

ALBANY: Adirondack Mountain Club, 47 Hollywood Ave.
Army Navy Supply, 16 Steuben St. at Broadway

BATAVIA: Sleght's Book Store, 67 Main St.

BELLPORT, L.I.: The Sou'wester Bookshop, Main St.

BINGHAMTON: Babcock, Hinds & Underwood, 174 Washington St.

BUFFALO: G & R Tackle Co., 2895 Seneca St.
Hevenor Map Co., 350 Ellicott St.
Otto Ulbrich Co., Inc., 446 Main St.

CANTON: Big Stevens Store

CENTRAL SQUARE: Central Square Florist, 106 East Ave.

CHESTERTOWN: T. J. Fish & Son, Triangle Shopping Area

COOPERSTOWN: Augur's Book Store, 73 Main St.

CORNING: Cunnings, Inc., 16 E. Market St.

CORTLAND: Mullen Office Outfitters, 28 Main St.

DOWNSVILLE: Downsville Hardware & Building Supply

ELMIRA: Benson, Jessup, & Knapp, Inc., 809 Pennsylvania Ave
George C. MacGreevey, 313-315 E. Water St.

FORESTPORT: Robert F. Geary, Geary's General Store

GENEVA: Louis & Karl Klopfer, 23 Seneca St.

GLENS FALLS: Russell & Wait, Inc., 174 Glen St.

GLOVERSVILLE: Gloversville Sport Shop, 6 E. Fulton St.

HUDSON: William H. Ziesentz Sons, Inc., 532 Warren St.

HUNTINGTON, L.I.:
Hulsen's Gunshop, 35 Mill Lane

ILION: Bonn's Sport Shop, 45 W. Main St.
Van's Sportland, 62 Central Ave.

INDIAN LAKE: Corner Variety Store, Beecher King

INLET: Inlet Appliances, Inc.

ITHACA: Cornell Campus Store, Barnes Hall
The Corner Bookstore, 109 N. Tioga St.
Triangle Bookstore, 403 College Ave.

JOHNSTOWN: Newton & Morrison, 9 W. Main St.

KINGSTON: O'Reilly Stationery Co., Inc., 38 John St.

LAKE CLEAR JUNCTION:
George A. Donaldson & Sons, Inc.

LAKE PLACID: Tradewind Sport Shop, 239 Main St.

LATHAM: The Boston Store, Latham Shopping Center

LIVINGSTON MANOR:
Rudy Fura, Hobby & Stationery Store

MASSENA: Westcott's Stationery Store, 61 Main St.

MIDDLETOWN: Bob Lounsbury Sporting Goods, 104 North St.

MIDDLEVILLE: West Canada Sport Shop, 10 Bridge St.

NARROWSBURG: Snug Harbor

NEW BERLIN: Warren Prentice, Silver Lake R.D., No. 2

NEWBURGH: M. F. Kinney Corporation, 364 Broadway

NEW YORK CITY: American Map Co., Inc., 347 Madison Ave. (1)(3)
Hagstrom Co., Inc., 311 Broadway (1)
Hammond Map Store, Inc., 1 East Forty-third St. (1)(2)(3)
International Map Co., Inc., 140 Liberty St. (3)
Rand McNally & Co., 7 West Forty-eighth St. (1)(2)(3)
Solomon Sporting Goods Co., Inc., 79 Chambers St.

NIAGARA FALLS: The Book Corner, 348 Third St.

NORWICH: Chenango Co. Soil & Water Cons. Dt., 99 N. Broad Street

OLD FORGE: Old Forge Hardware & Furniture Co., Inc.

ONEIDA: Henderson's Inc., 115 Lenox Ave.

OTTER LAKE: Standard Supply Co.

PHOENICIA: Folkerts Brothers

PLATTEKILL: Carpenter's Gun Works

PLATTSBURGH: Beemer's Inc., 10 Brinkerhoff St.

POTSDAM: J. R. Weston, Inc.

POUGHKEEPSIE: H. Morris McComb, 279 Main St.

RIVERHEAD: Edwards Discount Center, E. Main St. & Rt. 58 (1)

ROCHESTER: Scrantom's Book & Stationery Co., Inc., 334 Main St. E.

SABAEL: The Lake Store

SARANAC LAKE: Adirondack Store, Saranac Lake-Lake Placid Rd. (Rte. 86)
Blue Line Sport Shop, Inc., 32 Broadway
Harvey's Bookstore, 46 Main St.

SCHENECTADY: Goldstock's, 121 N. Broadway
The Union Book Co., 237 State St.

SCOTIA: Sports & Crafts Shop, 104 Mohawk Ave.

SHERBURNE: Bigelows Pharmacy

SYRACUSE: Economy Book & Stationery Store, Inc., 317 S. Salina St.
Syracuse Univ. Bookstore, 303 University Place

TROY: Cahill's, 26 Fourth St.
Robert H. Hill & Co., 451 Broadway

TUPPER LAKE: Maid & Monakey, Inc.

UTICA: Nelson Hardware, 337 Bleecker St.
Watford Drug Co., 202 Genesee St.

WATERTOWN: Robinson's Book Store, Inc., 138 Court St.

WELLSVILLE: Hoover's Stationery

WOODSTOCK: The Catskill Book & Record Shop, Inc.,
35 Mill Hill Rd.

NORTH CAROLINA

ASHEVILLE: Talman's Book Center, 14 College St.

CHARLOTTE: Duncan Printmakers, 315 E. Seventh St.

HENDERSONVILLE: Sinclair Office Supply, 218 N. Main St.

MOREHEAD CITY: Dee Gee's Gift Shop, Waterfront-Evans St. (1)

RALEIGH: Raleigh Blue Printers, 126 W. Martin St. (1)

ROCKY MOUNT: Garrett Forestry Supply Co., 522 N. Church St.

NORTH DAKOTA

BISMARCK: North Dakota State Water Conservation Commission,
1301 State Capitol Building

MINOT: Gaffaney's

OHIO

ATHENS: Logan's Bookstore

CANTON: Baer's of Canton, 320 Cleveland Ave. N.W.

CHILLICOTHE: Herrnstein Hardware, 72 N. Paint St.

CINCINNATI: Cincinnati Div. of Engr., 406 City Hall,
Eighth & Plum Sts.

CLEVELAND: Aerial Surveys, Inc., 4614 Prospect Ave.
Burrows Brothers Co., 419 Euclid Ave.
Commercial Survey Co., 205 Caxton Bldg.,
812 Huron Rd.

COLUMBUS: Ohio Geological Survey, 1207 Grandview Ave.
Varsity Supply Co., 1600 N. High St.

RAVENNA: John K. Smith, P.O. Box 652

SHEFFIELD LAKE: Ohio Canoe Adventures, Inc. 5128 Colorado Ave.

STEUBENVILLE: Director, Jefferson County Regional Planning Commission, 423 North St.

TOLEDO: Franklin Printing & Engraving Co., 228 Huron St.

WARREN: Trumbell Co. Planning Comm., Adm. Bldg., 160 High St. N.W.

ZANESVILLE: Acme Chemprint, 2542 Maple Ave.

OKLAHOMA

NORMAN: Director, Oklahoma Geol. Survey, Univ. of Oklahoma

OKLAHOMA CITY: Triangle Blue Print & Supply Co., 525 N. Robinson St.

TULSA:
Kelly Map Co., Kennedy Bldg.
Midcontinent Map Co., 114 W. 3rd.
Triangle Blue Print & Supply Co., 314 S. Cincinnati St.

OREGON

ASTORIA: Utzinger's Book Store, 1292 Commercial St.

COOS BAY:
Coos Bay Stationery Co., 164 N. Broadway
Hale & Rudin, 300 Central Ave.

CORVALLIS: O. S. U. Book Stores, Inc., Memorial Union Bldg.

EUGENE: Cressey's, 864 Willamette St. (1)

GRANTS PASS:
Barretts Stationery & Office Supply, 425 S.E. Sixth St.
Pete Boyko Stationery, 220 N.W. Sixth St.

HILLSBORO: Map & Print Service, 934 S. E. Baseline St.

KLAMATH FALLS:
The Gun Store, 714 Main St.
Klamath County Title Co., 422 Main St.

MEDFORD: Swem's Book & Gift Shop, 217 E. Main St.

PORTLAND:
Alpine Hut, Inc., 1250 Lloyd Center
Cascade Microfilm Systems, Inc., 1037 S.W. Fifth Ave
J. K. Gill Co., 408 S.W. Fifth Ave.
Oregon Blue Print Co., 930 S.E. Sandy Blvd.
Spencer B. Gross, 3122 S.W. Eighty-seventh Ave.
Klindt Vielbig, Cloud Cap Chalet, 1127 S.W. Morrison St.

ROSEBURG: Roseburg Book & Stationery Store, 549 S.E. Jackson St.

SALEM: Commercial Book Store, 120 Commercial St. N.E.
Salem Surplus Sales, 201 Commercial St. N.E.

SPRINGFIELD: Springfield Stationery, 615 Main St.

PENNSYLVANIA

ALLENTOWN: Nestor Sporting Goods, Inc., 2510 MacArthur Rd.

BETHLEHEM: H. M. Paul & Son, Office Furniture & Stationery, 529 W. Broad St.

BRADFORD: Francis J. Talerico, 43 N. Bennett St.

BROOKVILLE: DeMans, 295 Main St.

EPHRATA: Lester R. Sauder, Books & Bibles, R.R. 1

ERIE: Commercial Blue Print & Supply Co., 201 E. Tenth St.

HANOVER: J. W. Fischer & Co., 28 Carlisle St.

HAWLEY: J. Vance Hunt & Son

HAZLETON: Deemer & Co., 224 W. Broad St.

INDIANA: Henry Hall, Inc.

JACOBUS: Straley's, 28 Seven Valleys Rd.

JOHNSTOWN: Turner's Key Shop, 325 Market St.
Warren Phenicie, 100 Nees Ave.

LANCASTER: L. B. Herr & Son, 46-48 W. King St.

LEMOYNE: Camp Hill Distributors, 331 Market St.

LEWISTOWN: Aurand's, 229-231 E. Third St.

MEADVILLE: Hunters News, 297 Chestnut St.

MILFORD: Sportsmen Rendezvous 133 W. Harford St.

MILLHEIM: John W. Cooner

MORRIS: Miller's Store

PAOLI: Bookmark, 4 E. Lancaster Ave.

PHILADELPHIA: J. L. Smith Co., 27 S. Eighteenth St. (3)

PITTSBURGH: Pen-Oh-Wes Map Co., 511 Magee Bldg., 336 Fourth Ave.
J. R. Weldin Co., 413-415 Wood St.

READING: Moyer's Stationery, Inc., 525 Penn Sq.

SAINT MARYS: Smith's Sport Store, 10 Erie Ave.

SCRANTON: Deemer & Co., 209 N. Washington Ave.

STOUDSBURG: Monroe Engineering, Inc.,804 Sarah St.

WATERVILLE: Love's Service Station

WELLSBORO: Focht's Cut Rate Store, 81 Main St.

WILKES-BARRE: Deemer & Co., 6 W. Market St.

WILLIAMSPORT: Plankenhorn Stationery Co., 144 W. Fourth St.

PUERTO RICO

SAN JUAN: Topographic Mapping & Photogrammetry, Dept. de Obras Publicas, Parada 22 1/2

RHODE ISLAND

PROVIDENCE: The Map Center, 86 Weybosset St.

SOUTH CAROLINA

CHARLESTON: Coleman Marine Supply Co., 211 East Bay St. (2)
J. J. W. Luden & Co., 158 E. Bay St. (1)
Marine Center, Charleston Marina, Yacht Basin

CHARLESTON HEIGHTS: Marine Center, 4752 River Ave. (1)

COLUMBIA: Department of Geology, Univ. of South Carolina

SOUTH DAKOTA

CUSTER: I. J. Hauptmann, LeRoy Hotel-Motel

RAPID CITY: South Dakota School of Mines & Technology, Dept. of Geology & Geological Engineering

TENNESSEE

CHATTANOOGA: Tennessee Valley Authority, Map Information and Records Unit, 110 Pound Bldg.

KNOXVILLE: Tennessee Valley Authority, Maps and Engineering Records Section, 102-A Union Bldg.

NASHVILLE: Tennessee Department of Conservation, Division of Geology, G-5 State Office Bldg.

TEXAS

AMARILLO: Browning Blue Print Co., 310 Taylor St.

AUSTIN: Miller Blue Print Co., 108 E. Tenth St.

CORPUS CHRISTI: Nixon Blue Print Co., 116 Vaughn Plaza Bldg.

EL PASO: R. M. Metcalfe Co., 210 N. Campbell St.

FORTH WORTH: Lost Map Co., 7260 Oxley

HOUSTON: Gaylord Stickle Co., 503 First City Nat'l. Bank Bldg.
Zingery Map Co., Aerial Photo Div., 252 Esperson Bldg.

HUNSTVILLE: Fox Reproduction Co., 1209 Ave. K

LIVINGSTON: Livingston Reproductions, Israel Rd.

MIDLAND: Pronto Drafting Service and Color Reproduction Lab. 307 N. Big Spring

ODESSA: Odessa Reproduction Co., 411 W. Fifth St.

SAN ANTONIO: Ferguson Map Co., 112 Dwyer Ave.

TEXARKANA: Al Williams, Inc., 801 State Line

TYLER: Acme Map Company, 311 W. Erwin

UTAH

MOAB: Moab Blueprint Co., 61 E. Center St.

OGDEN: The Bookmark, Inc., 3065 Harrison Blvd.

SALT LAKE CITY: Pembroke Co. 24 E. Broadway
Photo-Blue Co., 123 E. Second St.

VERMONT

BARRE: Capitol Stationers, Inc., 173 N. Main St.

BENNINGTON: Bennington Bookshop, Inc., 416 Main St.

BRATTLEBORO: Baker's Bookstore, 85-91 Main St.
The Book Cellar, 120 Main St.
Lewis R. Brown, Inc., 34-36 Main St.

BURLINGTON: McAuliffe Paper Co., Inc.

CHESTER: The National Survey

HARDWICK: Hardwick News Store

ISLAND POND: Boylan Brothers Hardware

MIDDLEBURY: Vermont Book Shop, 38 Main St.

MONTPELIER: Capitol Stationers, Inc., 65 Main St.

NEWPORT: The Treasure Shop

RUTLAND: The Tuttle Stationery Co., Inc.

ST. JOHNSBURY: O. Dean Hale, Inc., 53 Main St.

WOODSTOCK: The Yankee Bookshop

VIRGINIA

CHARLOTTESVILLE:
Virginia Div. of Mineral Resources, P.O. Box 3667, University Station

KILMARNOCK: David E. Willing, W. & W. Sporting Center

LYNCHBURG: J. P. Bell Co., 816 Main St.

NEWPORT NEWS: E. Smola Co., 134 Twenty-fifth St. (1)(2)

NORFOLK: Henry Eagleton Co., 430 Boush St.

RICHMOND: Cooper-Trent, Inc., 1705 Chamberlayne Ave.

ROANOKE: Malcolm Blueprint & Supply Corp., 632 Second St. S.W.

VIRGIN ISLANDS

CHRISTIANSTED: Merrill's Apothecary, 4 A & B Queen Bess Ct.

CHARLOTTE AMALIE:
Pet's Fancy-Island Shop, Box 1078

WASHINGTON

AMANDA PARK: U.S. National Park Service, Olympic National Park, Quinault River Ranger Station, Route 2, Box 76

BELLINGHAM: Griggs, 120 E. Holly St. (1)

EVERETT: Black & King, Inc., 2944 Colby Ave. (1)

MONTESANO: Montesano Hardware, 210 S. Main St.

PASCO: Shields Books & Stationery, 411 W. Lewis St.

RENTON: Alpine Hut, Inc., No. 4, Renton Shopping Center

SEATTLE: Alpine Hut, Inc., No. 1, 2650 University Village
Max Kuner Co., 1324 Second St. (1) (2)
Metsker Maps, 1222 Third Ave. (1) (2)
Recreational Equipment, Inc., 523 Pike St.

SPOKANE: John W. Graham & Co., 707-711 Sprague Ave.

TACOMA: Alpine Hut, Inc., No. 3, 420 Tacoma Mall
Metsker Maps, 111 S. Tenth St. (1) (2)

VANCOUVER: Arnold Map Service, 119 W. 24th. St.

WALLA WALLA: Columbia Reproductions Co., 30 S. Colville

WENATCHEE: Adams Sport & Swap Shop, 501-509 S. Mission

YAKIMA: Broad's, 22 N. Second St.

WEST VIRGINIA

CHARLESTON: Keller's Photoprint Service, 808 Kanawha Blvd. E.
The S. Spencer Moore Co., 118 Capitol St.

CLARKSBURG: The James & Law Co., 217 W. Main St.

HARRISVILLE: Orpha A. Riggs, 128 N. Spring St.

HUNTINGTON: Technical Reproduction and Supply Corp., 826 Sixth Ave.

MORGANTOWN: West Virginia Geological and Economic Survey

PARKERSBURG: Stephens Blueprint & Supply Co., 311 Market St.

WHEELING: Precision Draftprint Co., 4 Bethany Pike

WISCONSIN

ANTIGO: Sport Marine, Inc., 713 Superior St.

CRANDON: The Forest Republican, 106 W. Madison St.

EAGLE RIVER: Vilas County Clerk

HAYWARD: Risberg Recreational Real Estate

KAUKAUNA: Clarkson Map Co., 724 Desncyer St.

LAKEWOOD: Charlie Popp

MADISON: University Book Store, 702 State
State Geologist & Director, Geol. & Natural History Survey, 1815 University Ave.

MENOMONEE FALLS:
Tri-County Blueprint Service, Inc., Highway 41, River Court Shopping Center

MILWAUKEE: Milwaukee Map Service, 3921 N. Twenty-first St.
Star Map Service, 2247 N. 55th.

MINOCQUA: Lakeland Sport Shop
Ross Sportwear Inc., 503 Oneida St.

PARK FALLS: Art Schmidt

STEVENS POINT: Hunter's Corner, 1000 Main St.

SUPERIOR: Lund's Sport Shop, Inc., 1815 Belknap St.

TOMAHAWK: Bennetts Sporting Goods, 24 W. Wisconsin

TOWNSEND: John N. Peil, Peil's D. X. Service

TWO RIVERS: Gil's Sporting Goods, 1916 Washington St.

WISCONSIN RAPIDS:
Anthony B. Kiedrowski, Route 2

WYOMING

CASPER:	J. A. Waatti Map Co., 246 S. Center St. Kintzel Blue Print Co., 134 N. Center St.
CHEYENNE:	Commercial Office Supplies, 112 W. 18th. St. Nisbet Stationery, 1610 Capitol Ave.
CODY:	John S. Bereman & Co., Court House New Post Office Store, 1121-13th. St.
RIVERTON:	Trego's Book Shop, 310 E. Main St.
SHERIDAN:	Sheridan Stationery Co., 206 N. Main St.

7. ATLASAS

A large number of atlases suitable for classroom use are on the market. Only a selection of the most useful and currently available English language atlases are listed here. Two divisions are used--general world reference atlases, and thematic and regional atlases. The former type attempt to survey the entire world and most often contain physical-political maps of various scales and a selection of special subject maps. The second group of atlases focus on a specific subject, such as highwaysor landforms, or a special region, such as Africa or Southeast Asia. Atlases of relatively small areas, such as states in the United States, have not been included in this listing. Each major group has been divided on the basis of list cost.

World Reference Atlases

Under $5.00:

Classroom Atlas (5th ed.; Chicago: Rand McNally & Co., 1965), 7 1/2 X 10, 86 pages (72 of maps, 14 of gazetteer and index), soft cover.

Colorprint Scholastic World Atlas (3rd. ed.; New York: American Map Co., 1968), 9 1/2 X 12 1/2, 48 pages (40 of maps, 8 of gazetteer and index), soft cover.

Colorprint Student's Atlas of the World (8th. ed.; New York: American Map Co., 1968), 9 1/2 X 12 1/2, 24 pages (16 of maps, 8 of gazetteer and index), soft cover.

Comparative World Atlas (Maplewood, N.J.: Hammond Inc., 1967), 9 1/2 X 12 1/2, 48 pages (42 of maps, 6 of gazetteer, index, pictures), soft cover.

Ginn World Atlas (Boston: Ginn & Co., 1965), 7 1/2 X 10 1/8, 64 pages (45 pages of maps, 17 of index), soft cover. (48 page work book also available.)

Man's Domain: A Thematic Atlas of the World (New York: McGraw-Hill, 1968), 10 X 13 1/4, 78 pages (66 of maps, 6 of index, 5 of information), soft cover.

The Oxford Home Atlas of the World (revised edition; New York: Oxford University Press, 1967), 7 1/2 X 10, 144 pages (112 of maps, 32 of gazetteer), hard cover.

Philips' Commercial Course Atlas (London: George Philip, 1966), 9 X 11 1/2, 124 pages (88 of maps, 36 of gazetter and other materials), hard cover.

Philips' Modern World Atlas (London: George Philip, 1962), 7 1/2 X 9, 31 pages (24 of maps, 7 of index), soft cover.

Philips' New School Atlas(London: George Philip, 1967), 9 X 11, 87 pages (64 of maps, 23 of index), hard cover.

Regional Atlas (3rd edition; Chicago: Rand McNally & Co., 1964), 9 X 11, 66 pages (50 of maps, 15 of index and statistical data), soft cover.

Students' Political Atlas of the World (Chicago: Rand McNally & Co., 1964), 8 3/4 X 11, 50 pages (40 of maps, 10 of index), soft cover.

Visual-Relief Atlas of World Continents (Chicago: Denoyer-Geppert Co., 1966), 8 1/2 X 11, 32 pages (20 of maps, 11 of index and tables), soft cover.

World Atlas for Students (Maplewood, N.J.: Hammond Inc., 1964), 9 1/2 X 12 1/2, 55 pages (52 of maps, 3 of gazetteer-index), soft cover.

The World . . . Its Geography In Maps (Chicago: Denoyer-Geppert Co., 1965), 8 1/2 X 11, 96 pages (43 of maps, 50 of text and index), soft cover.

$5.00 to $10.00:

Cartocraft Geography School Atlas (London: George Philip, 1967), 9 X 11 1/2, 132 pages (100 of maps, 32 of index and statistics), hard cover.

Citation World Atlas (Maplewood, N.J.: Hammond Inc., 1966), 9 1/2 X 12 1/2, 368 pages (combining maps, index, and statistical data), hard cover.

The Concise Oxford Atlas (revised edition; New York: Oxford University Press, 1966), 7 1/2 X 10, 288 pages (120 of maps, 168 of gazetteer), hard cover.

Goode's World Atlas (12th edition; Chicago: Rand McNally & Co., 1964), 9 1/2 X 11 1/4, 300 pages (170 of maps, 123 of index, and statistical data), hard cover.

International World Atlas (Maplewood, N.J.: Hammond Inc., 1966), 9 1/2 X 12 1/2, 200 pages (combining maps, index & statistical data), hard cover.

Life World Library, *Atlas of the World* (New York: Time, Inc., 1966), 8 1/2 X 11, 160 pages (81 of maps, 79 of index and statistical data), hard cover.

Panoramic World Atlas (Maplewood, N.J.: Hammond Inc., 1967), 9 1/2 X 12 1/2, 208 pages (146 of maps, 62 of index and other material), hard cover.

Prentice-Hall World Atlas (2nd edition; Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1963), 8 3/4 X 12 1/4, 137 pages (96 of maps, 41 of index and statistical data), hard cover.

Over $10.00:

Ambassador World Atlas (Maplewood, N.J.: Hammond Inc., 1966), 11 3/4 X 15 1/4, 365 pages (combining maps, index, and statistical data), hard cover.

Atlas of the World (2nd edition; Washington, D.C.: National Geographic Society, 1966), 19 X 25, 343 pages (145 of maps, 161 of index, 36 of text), hard cover.

John Bartholomew, Physical World Atlas, (New York: American Map Co., 1968), 10 X 15, 168 pages (117 of maps, 51 of index), hard cover.

John Bartholomew, The Times Atlas of the World (Boston: Houghton Mifflin Co., 1967), 12 X 18, 562 pages (121 double page maps, 48 of text and charts, 272 of index and other information), hard cover.

Medallion World Atlas (Maplewood, N.J.: Hammond Inc., 1966), 11 3/4 X 15 1/2, 464 pages (combining maps, index, and statistical data), hard cover.

Odyssey World Atlas (New York: Odyssey Books, 1966), 12 1/8 X 16 3/16, 320 pages (172 of maps, 148 of statistical data and index), hard cover.

The International Atlas (Chicago: Rand McNally & Co., 1969), 11 X 14 3/4, 554 pages (280 of maps, 32 of text and maps and 274 of index and statistical data) hard cover.

The Oxford Atlas (revised edition; New York: Oxford University Press, 1967), 10 1/2 X 15 1/2, 202 pages (112 pages of maps, 90 pages of gazeteer), hard cover.

Thematic and Regional Atlases

Under $5.00:

Andrew Boyd, An Atlas of World Affairs (5th revised edition; New York: Frederick A. Praeger, 1966), 5 3/8 X 8, 160 pages (70 of maps, 90 of index and text), soft cover.

Andrew Boyd, Patrick Van Rensburg, and W. H. Bromage, An Atlas of African Affairs (New York: Frederick A. Praeger, 1962), 5 3/8 X 8, 133 pages (56 of maps, 77 of index and text), soft cover.

Atlas of American History (Maplewood, N.J.: Hammond Inc., 1967), 9 1/2 X 12 1/2, 40 pages (39 of maps), soft cover.

Atlas of American History, (New York: Oxford University Press, 1964), 7 1/2 X 10, 72 pages (48 of maps, 17 of gazetteer), soft cover.

Atlas of European Cities (Maplewood, N.J.: Hammond Inc., 1967), 5 X 8, 96 pages (42 of maps, 54 of descriptive material), soft cover.

Atlas of European History (New York: Oxford University Press, 1956), 7 1/2 X 10, 88 pages (64 of maps, 24 of text and gazetteer), soft cover.

Atlas of World History (Maplewood, N.J.: Hammond Inc., 1967), 9 1/2 X 12 1/2, 48 pages (47 of maps), soft cover.

Thomas F. Barton, Robert C. Kingsbury, and Gerald Showalter, Southeast Asia in Maps (Chicago: Denoyer-Geppert, 1969), 8 1/2 X 11, 96 pages of maps and text, soft cover.

Complete Atlas of Japan (London: George Philip, 1964), 8 1/2 X 11 3/4, 58 pages (33 of maps, 22 of index and text) soft cover.

Concise Atlas of the British Isles (New York: Oxford University Press, 1962), 7 1/2 X 10, 68 pages (31 of maps, 37 of text and gazetteer), soft cover.

Harry A. Gailey, Jr., The History of Africa in Maps (Chicago: Denoyer-Geppert, 1967), 8 1/2 X 11, 96 pages (46 of maps, 50 of text and statistical data), soft cover.

Hammond Road Atlas (Maplewood, N.J.: Hammond Inc., 1968), 6 1/2 X 12 1/2, 48 pages, soft cover.

Robert C. Kingsbury, South Asia in Maps (Chicago: Denoyer-Geppert, 1969), 8 1/2 X 11, 96 pages of maps and text, soft cover.

Robert C. Kingsbury and Norman J. G. Pounds, An Atlas of European Affairs (New York: Frederick A. Praeger, 1964), 5 3/8 X 8, 135 pages (59 of maps, 74 of index and text), soft cover.

Robert C. Kingsbury and Norman J. G. Pounds, An Atlas of Middle Eastern Affairs (New York: Frederick A. Praeger, 1963), 5 3/8 X 8, 117 pages (58 of maps, 59 of index and text), soft cover.

Robert C. Kingsbury and Ronald M. Schneider, *An Atlas of Latin American Affairs* (New York: Frederick A. Praeger, 1965), 5 3/8 X 8, 136 pages (60 of maps, 76 of index and text), soft cover.

Robert C. Kingsbury and Robert N. Taaffe, *An Atlas of Soviet Affairs* (New York: Frederick A. Praeger, 1965), 5 3/8 X 8, 143 pages (65 of maps, 78 of index and text), soft cover.

Philips' China in Maps (London: George Philips, 1968), 11 X 3 1/2, 25 pages (maps & text), soft cover.

Philips' Modern College Atlas for Africa (London: George Philips, 1965), 163 pages (131 of maps, 32 of index), soft cover.

Philips' Soviet Atlas (London: George Philips,1965), 10 X 7 1/2, 32 pages (maps and text), soft cover.

Shorter Oxford Economic Atlas of the World (2nd edition; New York: Oxford University Press, 1966), 7 1/2 X 10, 101 pages of maps (plus text, tables, diagrams), soft cover.

$5.00 to $10.00:

Atlas of World History (Chicago: Rand McNally & Co., 1957), 216 pages (128 of maps, 60 of text and appendix), hard cover.

Jean Dalfus, *Atlas of Western Europe* (Chicago: Rand McNally & Co., 1963), 9 3/4 X 13, 48 pages (35 of maps, 13 pages of text), hard cover.

Oxford Regional Economic Atlas of Africa (New York: Oxford University Press, 1965), 7 1/2 X 10, 228 pages (112 of maps, 60 of text and statistics, 56 of index and gazetteer), soft cover.

Oxford Regional Economic Atlas of Middle East and North Africa (New York: Oxford University Press, 1960), 7 1/2 X 10, 140 pages (64 of maps, 56 of text and statistics, 20 of index and gazetteer) soft cover.

Oxford Regional Economic Atlas of the United States and Canada (New York: Oxford University Press, 1967), 7 1/2 X 10, 163 pages (128 of maps, 35 of index and gazetteer), soft cover.

Oxford Regional Economic Atlas of U.S.S.R. and Eastern Europe (New York: Oxford University Press, 1956), 7 1/2 X 10, 140 pages (69 of maps, 39 of text and statistics, 32 of index and gazetteer), soft cover.

James L. Scovel, Emmett J. O'Brien, J. C. McCormack and R. B. Chapman, Atlas of Landforms (New York: John Wiley, 1966), 14 3/8 X 12 1/4, 164 pages (155 of maps and aerial photographs, 9 of index), soft cover.

Over $10.00:

Atlas of Britain and Northern Ireland (New York: Oxford University Press, 1963), 15 X 20, 234 pages (200 of maps, 34 of gazetteer and notes), hard cover.

Atlas of South-East Asia (New York: St. Martin's Press, 1964), 10 X 13 1/2, 102 pages (59 of maps, 43 of text, statistics, and index), hard cover.

Oxford Economic Atlas of the World (3rd edition; New York: Oxford University Press, 1965), 7 1/2 X 10, 286 pages (101 of maps, 185 of text, tables, diagrams, and statistical index), hard cover.

Shepherd's Historical Atlas (9th edition; New York: Barnes & Noble, 1964), 7 X 10 1/2, 341 pages (226 of maps, 115 of contents and index), hard cover.

8. AERIAL AND SPACE PHOTOGRAPHY

Aerial Photography of the United States

Recent stereoscopic vertical aerial photography on the scale of 1:40,000, or larger, covers all of the United States. This photography is far more complete and more recent than is our large scale topographic map coverage. The bulk of this photography has been completed for or is owned by federal government agencies although a few commercial firms also have photography for sale. From the geography teacher's viewpoint, probably the best available photography is that owned by the Department of Agriculture which covers a high percentage of the United States.

Federal government aerial photographs of the United States are relatively easy to obtain. The best procedure is to write to:

Map Information Office
U.S. Geological Survey
Washington, D.C. 20242

This office acts as a central clearing house for all federal government mapping and aerial photography work. Two important status maps, updated often, are both available free on request: _Status of Aerial Photography in the United States_ and _Status of Aerial Mosaics in the United States_. Only the coverage considered most suitable for general use--the primary photography--is shown. (Thus, duplicated coverage, which very often exists, is not indicated.) Examination of these status maps will indicate the government or commercial agency and their address holding the negatives for photographs or mosaics of any particular area. The agency may then be written to directly for additional index maps (usually also free) or for inquiries about specific areas of interest. The major federal government photographic agencies are:

Aerial Photography Division
Agricultural Stabilization and Conservation Service
U.S. Department of Agriculture
  Western Laboratory
    2505 Parleys Way,
    Salt Lake City, Utah 84109
    (for photography of Texas, Oklahoma, Kansas, Nebraska, South Dakota, North Dakota, and westward)
  Eastern Laboratory
    45 South French Broad Avenue
    Asheville, N.C., 28801
    (for photography of states each of those listed above)

Cartographic Unit
Soil Conservation Service, Department of Agriculture
    Federal Center Building
    East-West Highway & Belcrest Rd.
    Hyattsville, Md. 20782

Forest Service
Department of Agriculture
    Washington, D.C. 20250
    (and regional laboratories in Missoula, Montana;
    Denver, Colorado; Albuquerque, New Mexico;
    Ogden, Utah; San Francisco, California;
    Portland, Oregon; Juneau, Alaska)

Geological Survey
Department of the Interior
    Washington, D.C. 20242
    (and regional laboratories in Arlington, Virginia;
    Rolla, Missouri; Denver, Colorado; Menlo Park,
    California)

Map Information and Records Unit
Tennessee Valley Authority
110 Pound Building
Chattanooga, Tennessee 37401

Coast and Geodetic Survey
Department of Commerce, E.S.S.A.
Washington Science Center
Rockville, Maryland 20852

Bureau of Land Management
Department of Interior
Washington, D.C. 20242

Any of the three Department of Agriculture agencies listed above will send free on request index status maps for any of the 50 states showing availability of its photographic coverage. These index maps indicate photographic scale, camera focal length, year of latest coverage, and availability of photo index sheets.

The next step, in the case of Department of Agriculture photography, is to order photographic indexes, generally on a county basis. Such indexes are uncontrolled assemblies of prints re-photographed at a much reduced scale. The purpose of consulting such photo indexes is to allow you to determine the exact photographs you require: the identifying numbers of individual photographs are clearly shown on a photo index. Many counties are covered by a single photo index, but for large counties in some states and/or for some large scale photography, a series of index sheets may be needed. Thus, Monroe Co., Indiana, is included on a single photo index sheet where Siskiyou Co., California, requires 30 index sheets.

In a county where there are many index sheets needed, the entire series need not be ordered. Thus, in Siskiyou Co., California, if you are interested only in the town of Weed, you can so specify on your order and obtain only the one photo index sheet needed to cover the town.

The Geological Survey and the Coast and Geodetic Survey do not issue state index status maps and requests for information on their photography should describe the specific area of interest by geographic coordinates, a detailed description, or a sketch.

The indexes of the U.S. Geological Survey and the Tennessee Valley Authority are also uncontrolled photo mosaics but the indexes of the Coast and Geodetic Survey are in map form. The latter type are a series of rectangles (representing individual photographs along flight lines) drawn on an outline map or drawn on tracing paper which is intended as an overlay for a topographic or other generally available map of the area concerned.

In addition to the federal government agencies, the map Status of Aerial Photography in the United States lists eight commercial firms and two state government agencies holding the negatives of primary photography for several parts of the United States. Their names and addresses are given on the rear of the status map. Another source of commercial vertical and oblique aerial photography is Stratex Instrument Company (address at the end of this booklet).

Individual aerial photographic prints, ordered on the basis of examining indexes, vary in price depending upon print size and quantity.

Current Prices (1968) of all Federal Government Aerial Photography:

	1-25 Copies	Over 25 Copies
Contact Prints (9" X 9")	$ 1.25	$ .90
Enlargements:		
14" X 14"	2.50	2.00
18" X 18"	2.75	2.25
26" X 26"	3.50	2.75
40" X 40"	8.00	7.00
Photo Indexes:		
20" X 24" (USDA, USGS)	2.50	----
10" X 12" (USGS)	1.50	----
Photo Index Map (C&GS)	.50	----

Government agencies do not stock aerial photographic prints or enlargements. They are custom processed for each order and orders from non-government personnel may take up to 30 days or more to be filled.

Contact stereoscopic aerial photography is available for much of the United States at the nominal scale of 1:20,000. This is the standard scale used by the Agricultural Stabilization and Conservation Service and by the Soil Conservation Service, although both agencies have some photography at other scales. Much of the Geological Survey photography is at 1:24,000 and the Forest Service at 1:15,840. The selection of scale, of course, depends upon intended photographic usage. The standard Geological Survey scale is to meet the requirements of their standard topographic map series at the same scale. As another example, the Forest Service photographs at 1:40,000 in areas where it wants to make only a general survey and at 1:15,840 where it wishes to complete detailed interpretation work. Other contact photography available from federal government agencies is between 1:3,000 and 1:80,000.

The photography available from the several Department of Agriculture agencies, especially from the Agricultural Stabilization and Conservation Service, is of particular value in geographic work because much of it is at an acceptable scale for interpretation work (1:20,000), it is consistently of high quality with clear and sharp images, and most of it has been taken during the summer months, at the height of agricultural and other cultural activities. By contrast, much of the Geological Survey photography has been taken during the cold period of the year which is more usable for contour mapping but is of less interest in geographic work.

In addition to the photography described, both high and low oblique photographs are available. The Geological Survey is a major source of low oblique photography and other oblique photography is available from government and commercial sources. Rolls of continuous strip photography (taken by a camera with no shutter bur rather a slit in the focal plane) have been made available at times by federal and commercial agencies. Infrared photography of selected areas can be secured from the Coast and Geodetic Survey, the Forest Service, and the Agriculture Stabilization and Conservation Service. Nine lens panchromatic aerial photography (taken on strip film 23" wide) is available from the Coast and Geodetic Survey at $15.00 per print. Contact prints of color photography are available for selected areas from the Geological Survey and the Coast and Geodetic Survey; current price of color prints from the Coast and Geodetic Survey is $5.00 each.

Most federal government photography taken prior to 1941 has been transferred to the National Archives. The bulk of the 2,250,000 aerial photographs held by the National Archives were flown during the period 1935-1941 by Department of Agriculture agencies and provide a unique record of the physical and cultural landscape of prewar America and are especially informative when compared with more recent photography. Indexes, contact prints, and enlargements of this older photography can be secured from:

Cartographic Branch
National Archives and Records Section
General Services Administration
Washington, D.C. 20408

The Air Photo Repository of the University of Illinois holds a considerable quantity of original aerial negatives mainly of areas in the United States. These were furnished by numerous Federal government agencies including the Department of Agriculture, Geological Survey, Coast and Geodetic Survey, and U.S. Air Force, as well as several state and commercial agencies. Some of this photography has been used to prepare a series of several hundred stereograms of many different areas in the United States and at various scales. These stereograms are supplied at cost:

	Number of Prints of a Single Stereogram		
	1-12	13-50	Over 50
5" X 7"	$ .30 each	$ .20 each	$.15 each
8" X 10"	.60 each	.50 each	.40 each

A free catalogue describing in detail the stereograms available as well as information on available materials can be secured from:

Committee on Aerial Photography
University of Illinois
713 South Wright Street
Champaign, Illinois 61820

Selected commercial aerial photographs for school use are marketed by Statex Instrument Co. (address in Section 10). Sources of aerial photographs in slide form are listed in Section 2 of this booklet. Lithographically printed stereograms are contained in books and manuals reviewed under "Aerial Photography and Other Remote Sensing" in Section 1 of this booklet.

Foreign Photography

About two-thirds of the earth's land area is known to have been photographed on a relatively large scale and at least once. In coverage, this includes all of North America and Western Europe, two-thirds of South America and Australia, one-half of non-communistic Asia, and at least one-half of Africa.

Coverage in the communist world is not well known. The known photography varies greatly in scale, quality, date, and availability. A great deal of known photography is unavailable for military security reasons, diplomatic problems, language barriers, or just "red tape." Various U.S. Federal Government agencies, including the Department of Defense, International Cooperation Administration, and the U.S. Geological Survey, have photographed large areas of Europe, Africa, and Asia, but this photography remains classified. Good foreign photography is difficult to obtain by a person in non-official capacity in the United States. If you are on-the-spot in a foreign country, photography is sometimes easier to obtain.

Two articles of interest on this subject are:

> Kirk M. Stone,"World Air Photo Coverage, 1960," Photogrammetric Engineering, Yearbook Number, 1961, pp. 214-227.
>
> Kirk M. Stone, "Procurement of Aerial Photography," Manual of Photographic Interpretation, American Society of Photogrammetry, Washington, D.C., 1960, pp. 19-26.

Contact stereoscopic aerial photographs, enlargements, and mosaics from many areas in Canada are relatively easy to obtain. Inquiries on availability should include specific information on areas of interest and should be sent to:

National Air Photo Library
Department of Energy, Mines, and Resources
Ottawa, Canada

For aerial photographs of British Columbia, inquiries should be sent to:

Director, Air Division
Surveys and Mapping Branch
Department of Lands, Forests, and Water Resources
Victoria, B.C., Canada

For aerial photographs of various areas in the British Isles, inquiries should be sent to:

Library, Aerofilms Ltd.
4 Albemarle Street
London, England

Space Photography

The several thousand space photographs taken on nine orbiting Gemini flights have been made available to the public by National Aeronautics and Space Administration. Photographs may be secured in either black-and-white or in color and in the form of slides (2" X 2"; 2 1/4" X 2 1/4"; 3 1/4" X 4"), transparencies (4" X 5"; 7 1/2" X 9 1/2"; 8" X 8"; 9" X 9"), and prints (5" X 7"; 8" X 8";8" X 10"; 11" X 11"; and other sizes). One source of this material is:

Still Photo Productions, Inc.
318 H Street, N.W.
Washington, D.C. 20001

Still Photo Productions will furnish lists on request of NASA photography of the various Gemini flights. These contain a description and location of each photograph and an identification number for ordering purposes. They also have available a selected list of 100 most interesting space photographs prepared specifically for study of the earth. Prices for color slides start at $.75 each, color transparencies at $3.00 each, and color prints at $2.85 each. Write Still Photo Productions for further information and their complete price list.

Another source of Gemini photography is:

Technology Application Center
University of New Mexico, Box 181
Albuquerque, New Mexico 87106

Technology Application Center will supply on request a number of special lists of Gemini photography selected specifically for use in various fields. Separate lists are available for Geography; Land Use, Urban Studies, and Anthropology; Meteorology; Geology; Hydrology; Oceanography. A catalogue of 900 slides is available for $1.00. Prices for color slides start at $.50, color transparencies at $15.00, and color prints at $7.50. A carefully selected group of 36 color super slides (35 mm.) of particular interest to geography, and complete with descriptions and location map, is available for $18.00. Write Technology Application Center for further information and their complete price list.

National Aeronautics and Space Administration has issued a number of educational publications, some of which reproduce space photographs and others of which are very helpful in the study and interpretation of space photography. Many of these publications are free; others are sold at nominal cost. A price list is available.

If you live in:	Write to: Educational Programs and Services at
Alaska Idaho Montana Northern California Oregon Washington Wyoming	NASA Ames Research Center Moffett Field, California 94035
Connecticut Maine Massachusetts New Hampshire New York Rhode Island Vermont	NASA Electronics Research Center 575 Technology Square Cambridge, Massachusetts 02139
Alabama Arkansas Louisiana Mississippi Missouri Tennessee	NASA George C. Marshall Space Flight Center Huntsville, Alabama 35812
Delaware District of Columbia Maryland New Jersey Pennsylvania West Virginia	NASA Goodard Space Flight Center Greenbelt, Maryland 20771
Florida Georgia Puerto Rico Virgin Islands	NASA John F. Kennedy Space Center Florida 32899
Kentucky North Carolina South Carolina Virginia	NASA Langley Research Center Langley Station Hampton, Virginia 23365

Illinois Indiana Iowa Michigan Minnesota Ohio Wisconsin	NASA Lewis Research Center 21000 Brookpark Road Cleveland, Ohio 44135
Colorado Kansas Nebraska New Mexico North Dakota Oklahoma South Dakota Texas	NASA Manned Spacecraft Center Houston, Texas 77058
Arizona Hawaii Nevada Southern California Utah	NASA Western Support Office 150 Pico Boulevard Santa Monica, California 90406

9. INTERPRETATION AND DRAFTING EQUIPMENT

Map and Aerial Photographic Interpretation Equipment
(stereoscopes, map measurers, magnifiers, etc.)

- Abrams Instrument Co.
- Air Photo Supply Corp.
- Alvin & Co., Inc.
- Bausch & Lamb Inc., Special Products Div.
- Denoyer-Geppert Co.
- Edmund Scientific Co.
- Forestry Suppliers Inc.
- Gordon Enterprises
- Hollywood Camera Co.
- Hubbard Scientific Co.
- Keuffel & Esser Co.
- North American Technological Operations
- Stratex Instrument Co.
- Transmares Corp.
- Ward's

General Drafting Supplies
(pens, papers, plastics, inks, other tools, etc.)

- Alvin & Co., Inc.
- Dick Blick Co.
- Arthur Brown & Bros., Inc.
- Charles Bruning Co.
- Central Scientific Co.
- Craftint Mfg. Co., Inc.
- Eugene Dietzgen Co.
- Forestry Suppliers Inc.
- Hunt Mfg. Co.
- Koh-I-Noor, Inc.
- Lewis Artist Supply Co.
- H. Lieber Co., Inc.
- The Lietz Co.
- Modern School Supplies
- Pickett Inc.
- Frederick Post Co.
- J. S. Staedtler, Inc.

Pre-Printed Materials
(lettering, screens, tapes, etc.)

- ACS Tapes, Inc.
- Ad-Letter Co., Inc.
- Alvin & Co., Inc.
- Applied Graphics Corp.

Artype Inc.
Bishop Industries Corp.
W. H. Brady Co.
Arthur Brown & Bros., Inc.
Cello-Tak Mfg., Inc.
Chart-Pak, Inc.
Craftint Mfg., Co.
Graphic Products Corp.
Instantype, Inc./ Mico-Type, Inc.
McGraw Colorgraph Co.
Mico Type, Inc.
Para-Tone, Inc.
Prestype/Prestape Co., Inc.
Russell Industries
Stanpat Products, Inc.
Stik-a-Letter Co.
Tactype Inc.
The Datak Corp.

10. ADDRESSES OF COMMERCIAL FIRMS LISTED IN THIS BOOKLET

Abrams Instrument Corp.
606 East Shiawassee Street
Lansing, Michigan

Academy Films distributed by:

Henk Newenhouse, Inc.
1825 Willow Road
Northfield, Illinois 60093

Air Photo Supply Corp.
Box 158, South Station
Yonkers, New York 10705

Allyn and Bacon, Inc.
Boston
Massachusetts 02210

Alvin & Co., Inc.
611 Palisado Avenue
Windsor, Connecticut 06095

American Geographical Society
Broadway at 156th Street
New York, New York 10032

American Map Co., Inc.
3 West 61st Street
New York, New York 10023

Applied Graphics Corp.
58 Shore Road
Glenwood Landing, New York 11547

Argosy Book Stores, Inc.
116 East 59th Street
New York, New York 10022

Artype Inc.
345 East Terra Cotta Avenue
Crystal Lake, Illinois 60014

Bausch & Lamb Inc.
Special Products Division
P.O. Box 543
Rochester, New York 14602

Benefic Press
10300 West Roosevelt Road
Westchester, Illinois 60153

ACS Tapes, Inc.
217 California Street
Newton, Massachusetts 02158

Ad-Letter Co., Inc.
7380 Beverly Boulevard
Los Angeles, California 90036

Bishop Industries Corp.
11728 Vose Street
North Hollywood, California 91605

Dick Blick Co.
Galesburg
Illinois 61401

Stanley Bowmar Co., Inc.
12 Cleveland Street
Valhalla, New York 10595

W. H. Brady Co.
727 W. Glendale Avenue
Milwaukee, Wisconsin 53209

Arthur Brown & Bros., Inc.
2 West 46th. Street
New York, New York 10036

Charles Bruning Co.
1800 West Central Road
Mount Prospect, Illinois 60068

J. S. Canner & Co., Inc.
618 Parker Street
Roxbury, Massachusetts 02119

CBS Learning Center
12 Station Drive
Princeton Junction, New Jersey 0854

Cello-Tak Mfg., Inc.
35 Alabama Avenue
Island Park, New York 11558

Cenco Scientific Co.
2600 South Kostner Avenue
Chicago, Illinois 60623

Chart-Pak, Inc.
One River Road
Leeds, Massachusetts 01054

University of Chicago
Department of Geography
1101 East 58th Street
Chicago, Illinois 60637

Civic Education Service
1733 K. Street, N.W.
Washington, D.C. 20006

Coronet Films
Sales Department
Coronet Building
64 East South Water Street
Chicago, Illinois 60601

Craftint Mfg. Co.
1615 Collamer Avenue
Cleveland, Ohio 44110

George F. Cram Co., Inc.
730 East Washington Street
P.O. Box 426
Indianapolis, Indiana 46206

C-Thru Ruler Co.
6 Britton Drive
Bloomfield, Connecticut 06002

The Datak Corp.
85 Highland Avenue
Passaic, New Jersey 07055

Denoyer-Geppert Co.
8535 Ravenswood Avenue
Chicago, Illinois 60640

Eugene Dietzgen Co.
2425 North Sheffield Avenue
Chicago, Illinois 60614

R. R. Donnelly
2223 South Dr. Martin Luther
  King, Jr. Drive
Chicago, Illinois 60614

Edmund Scientific Co.
101 East Gloucester Pike
Barrington, New Jersey 08007

Encyclopaedia Britannica Films, Inc.
1150 Wilmette Avenue
Wilmette, Illinois 60091

Farquhar Transparent Globes
5007 Warrington Avenue
Philadelphia, Pennsylvania 19143

Forestry Suppliers Inc.
205 West Rankin Street
Jackson, Mississippi 39202

General Drafting Co.
Convent Station
New Jersey 07961

Gordon Enterprises
5362 North Cahuenga Boulevard
North Hollywood, California 91601

H. M. Gousha Co.
2001 The Alameda
San Jose, California 95126

Graphic Products Corp.
3810 Industrial Avenue
Rolling Meadows, Illinois 60008

Hammond Inc.
Maplewood
New Jersey 07040

Hammond Map Store
1 East 43rd Street
New York, New York 10017

Hearne Brothers
Executive Offices
26th Floor--First National Building
Detroit, Michigan 48226

Historic Urban Plans
Box 76
Ithaca, New York 14850

Hollywood Camera Co.
6838 Sunset Boulevard
Hollywood, California 90028

Hubbard Scientific Co.
P. O. Box 105
Northbrook, Illinois 60062

Hunt Mfg. Co.
1405 Locust Street
Philadelphia, Pennsylvania
19102

Instantype, Inc./Mico-Type Inc.
7005 Tujunga Avenue
North Hollywood, California
91605

Instructo Products Co.
1635 North 55th Street
Philadelphia, Pennsylvania
19131

International Map Co., Inc.
140 Liberty Street
New York, New York 10006

Keuffel & Esser Co.
4839 Del Ray Avenue
Bethesda, Maryland 20014

Kistler Graphics, Inc.
4000 Dahlia Street
Denver, Colorado 80216

Koh-I-Noor, Inc.
100 North Street
Bloomsbury, New Jersey 08804

H. P. Kraus
16 East 46th Street
New York, New York 10017

Lewis Artist Supply Co.
6408 Woodward Avenue
Detroit, Michigan 48202

H. Lieber Co., Inc.
440 North Capitol Avenue
Indianapolis, Indiana 46204

The Lietz Co.
330 Corey Way
South San Francisco,
California 94080

Map Corp. of America
316 Summer Street
Boston, Massachusetts 02110

McGraw Colorgraph Co.
175 West Verdugo Avenue
Burbank, California 91503

McGraw-Hill Films
McGraw-Hill Book Co.
330 West 42nd Street
New York, New York 10036

Mico-Type, Inc.
7005 Tujunga Avenue
North Hollywood, California 91605

Modern School Supplies
High Street
Hartford, Connecticut 06101

Modern School Supply Co., Inc.
524 East Jackson Street
Goshen, Indiana 46526

National Film Board of Canada
680 Fifth Avenue
New York, New York 10019

National Geographic Society
17th and M Streets
Washington, District of Columbia
20036

News Map of the Week
7300 North Linder Avenue
Skokie, Illinois 60076

North American Technological
Operations
125 Pecks Road
Pittsfield, Massachusetts 01201

A. J. Nystrom & Co.
3333 Elston Avenue
Chicago, Illinois 60618

Orbis Terrarum
606 Metropolitan Avenue
Brooklyn, New York 11211

Pickett Inc.
Pickett Square
Santa Barbara, California 93102

Popular Science Publishing Co., Inc.
Audio-Visual Division
355 Lexington Avenue
New York, New York 10017

Erwin Raisz
130 Charles Street
Boston, Massachusetts 02114

Rand McNally & Co.
School Department
P.O. Box 7600
Chicago, Illinois 60680

Rockford Map Publishers, Inc.
4525 Forest View Avenue
Rockford, Illinois 61108

Russell Industries
96 Station Plaza
Lynbrook, New York 11563

Sanborn Map Co., Inc.
629 Fifth Avenue
Pelham, New York 10803

Society for Visual Education, Inc.
1345 Diversey Parkway
Chicago, Illinois 60614

J. S. Staedtler, Inc.
P. O. Box 68
Montville, New Jersey 07045

Edward Stanford, Ltd.
12-14 Long Acre
London WC2, England

Stanpat Products, Inc.
366 Main Street
Port Washington, New York 11050

Stik-A-Letter Co.
Box 1400
Escondido, California 92025

L. S. Straight
349 East 10th Street
New York, New York 10009

Stratex Instrument Co.
Los Angeles
California 90027

Tactype Inc.
43 West 16th Street
New York New York 10011

Teachers Publishing Corp.
23 Leroy Avenue
Darien, Connecticut 06820

Telberg Book Corp.
Map Depository
P.O. Box 545
Sag Harbor, Long Island
New York 11963

The National Survey
Chester, Vermont 05143

Thomas Bros.
550 Jackson Street
San Francisco, California 94133

Transmares Corp.
Carteret, New Jersey 07009

Valiant Instructional
Materials Corp.
172 Walker Lane
Englewood, New Jersey 07631

Ward's Natural Science
Establishment, Inc.
P.O. Box 1712
Rochester, New York 14603

Ward's of California
P.O. Box 1749
Monterey, California 93940

Weber Costello Co.
1900 North Narragansett Avenue
Chicago, Illinois 60639